

B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012

ENGLISH

(Common to all Branches)

Time: 3 hours

Max Marks: 70

Answer FIVE full questions at least one from Part B

All questions carry equal marks

Part A

- 1 "Inevitably, Ladakh is something of a test case of what good as well as bad can be brought by travelers." Elaborate.
- 2 "Keep the joy of loving the poor and share this joy with all you meet." Illustrate how Mother Teresa practiced it.
- 3 Amartya Sen is known in India as the Mother Teresa of economics. He spent his life time fighting poverty with analysis rather than activism – elaborate this statement by comparing his work with that of the Mother.
- 4 What is Tsunami and when did it struck the coast of Cuddalore? How did the administration respond?
- 5 (a) How was Anand initiated into the preliminaries of chess during his childhood?
(b) Describe the role of Anand as sports ambassador.
- 6 (a) Give an account of Charles Chaplin's childhood.
(b) How did Charles start his career?

Part B

- 7 (a) You are the general secretary of the college union. Write a formal letter to the principal of your college requesting her to have a telephone installed in the hostel for the use of the residents.
(b) You are a member of an NGO that works for street children. Compose a convincing letter to the ministry of social affairs describing the activities undertaken by your organization and requesting them to release a grant for the same.
- 8 (a) Provide one word substitutes:
(i) A person very hard to please is _____
(ii) handwriting that cannot be read is _____
(iii) A person who eats too much _____
(b) Use the following idioms in your own words
(i) A feather in one's cap
(ii) Apple of discord
(iii) To grease a persons palm
(c) Fill in the blanks with suitable prepositions:
(i) There was an accident _____ the crossroads this morning.
(ii) There are some beautiful trees _____ the park.
(iii) I like that picture hanging _____ the wall _____ the kitchen.
(d) Correct the following sentences
(i) If she looked at him, she would have talked to him.
(ii) If he worked hard, he will pass.
(iii) If I had talked to him, he will understand.
(e) Change the voice:
(i) Who makes a noise?
(ii) By whom was Gitanjali written?

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Part A

- 1 Visvesvaraya can be called the Mahatma of technologically independent India. Illustrate.
- 2 "She is the United Nations. She is peace in the World". Explain this statement in the context of Mother Teresa's life.
- 3 The narrator discovers something shocking about Miss Krishna almost at the end of the story. Elaborate.
- 4 On 13 Oct, 2009 Kurnool dist of A.P was devastated by floods. Imagine you are the district in charge of relief and rehabilitation operations. Relate Cuddalore experience and prepare a report on that of Kurnool.
- 5 Why did the author devoutly wish that he should have left the big boar alone?
- 6 Describe the various steps involved in the making of a film.

Part B

- 7 The Director of College education, Patna, Bihar, has been concerned about the poor academic standards and mismanagements of the affairs of various colleges in Patna. You, as the deputy director of education have been asked to enquire into the matter and submit a report to the university.
- 8 (a) Provide one word substitutes:
 - (i) Something that becomes outdated _____
 - (ii) Killing of human beings _____
 - (iii) A person who looks at the dark side of things _____
- (b) Use the following idioms in your own words:
 - (i) Bell the cat
 - (ii) In cold blood
 - (iii) To fight tooth and nail
- (c) Fill in the blanks with suitable prepositions:
 - (i) In India we drive _____ the left.
 - (ii) Write your name _____ the top _____ the page.
 - (iii) We stayed _____ a very nice hotel when we were _____ Amsterdam.
- (d) Correct the following sentences:
 - (i) If we made a noise, the teacher would have come to the class.
 - (ii) If I get first rank, I would join engineering.
 - (iii) If Rekha had met her uncle, she would come to know the fact.
- (e) Change the voice:
 - (i) When did they accept all the demands?
 - (ii) Ram told a story to sita

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Part A

- 1 The writer had imagined Ladakh to have had no contact with other parts of the world. How did he experience this remote, unusually undeveloped "Paradise"?
- 2 Elucidate Raman's work on: (a) Acoustics. (b) Optics.
- 3 (a) Amartya's intellectual horizon was radically broadened by the educational excellence of presidency college. Explain.
(b) Name some of books published by Amartya Sen.
(c) What are the awards received by Amartya Sen?
- 4 (a) Food, shelter, and clothing are the basic necessities of people. How were these necessities provided by the administration after tsunami?
(b) How did the department of health render its services to needy?
- 5 How did the writer accomplish the remainder of the journey after crossing the well?
- 6 "Avant-gardism is a luxury which we cannot yet afford in our country". Discuss.

Part B

- 7 (a) Write a letter to the principal of your college to arrange for a reading room in the library and also arrange for sports and games.
(b) Write a letter to your brother congratulating him on getting the first prize in the science talent search examination.
- 8 (a) Provide one word substitutes:
(i) One who studies our stars to predict our future _____
(ii) One who cures our foot ailments _____
(iii) One who is obsessed with stealing things _____
(b) Use the following idioms in your own words
(i) To see eye to eye
(ii) To build castles in the air
(iii) Put the horse before the cart
(c) Fill in the blanks with suitable prepositions:
(i) I had lost my key but I managed to climb _____ the house through a window.
(ii) Marcel is French. He has just returned _____ France after two years _____ Brazil.
(iii) Have you ever been bitten _____ a dog.
(d) Correct the following sentences
(i) If it is hot I would go out.
(ii) If they had called me, I would go.
(iii) If he attended the function, he would have met them.
(e) Change the voice
(i) We paid them a lot of money.
(ii) The police arrested the thief.

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Part A

- 1 How did Visvesvaraya develop Mysore into a model state?
- 2 Give an account of Raman's discovery during his voyage across the Mediterranean sea and how did it prove to be important.
- 3 (a) Miss Krishna was an extremely inquisitive woman. Give reasons to support this statement.
(b) Her death reveals a secret to the narrator. What is it?
- 4 People say Gertrude Elion was an advocate to the advancement of women in science. But Jon Elion thinks her as advocating the advancement of all persons in science. Do you think he is right. Give reasons.
- 5 'The heat made me sweat, but the laughter made me shake'. What does the author mean this statement?
- 6 Describe Chaplin as a legend.

Part B

- 7 (a) Write a short letter to Doordarshan whether it would be possible to repeat at some future time some of the episodes of 'Malgudi Days' which you have enjoyed seeing.
(b) Write a letter to the principal of your college requesting him to issue a transfer certificate.
- 8 (a) Provide one word substitutes:
(i) Study of the earth _____
(ii) One who believes in God _____
(iii) One who is obsessed with books _____
(b) Use the following idioms in your own words
(i) Blood is thicker than water
(ii) To wake up a sleeping dog
(iii) To enjoy the lion's share
(c) Fill in the blanks with suitable prepositions:
(i) I don't mind going _____ car, but I don't want to go _____ your car.
(ii) We had a discussion _____ what we should do.
(iii) Don't wait _____ me. I'll join you later.
(d) Correct the following sentences
(i) If you go now, you would catch the train.
(ii) If I meet him, he would help me.
(iii) If he applied for the job, he will get it.
(e) Change the voice
(i) The girl lost her purse.
(ii) Where was the pen found by him?

B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012
ENGINEERING PHYSICS
(Common to all Branches)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
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- 1 (a) Explain the principle of superposition of waves.
(b) Explain Young's experiment on the basis of wave theory.
(c) Two coherent sources produce interference pattern. Intensity ratio of bright fringe to dark fringe is 9:1. Calculate the intensity ratio of the sources.
- 2 (a) Identify whether unit cells of SC, BCC and FCC lattices are primitive or not. Explain with reason.
(b) What are the different space lattices in the cubic system?
(c) Iron has BCC structure with atomic weight 55.85 and density 7850 Kg/m^3 . Find the lattice constant.
- 3 (a) What are the main sources of electrical resistance in a metal? How does the conductivity of a metal vary with rise of temperature and added impurity content?
(b) Explain the concept of effective mass.
- 4 (a) State and explain law of mass action.
(b) Describe the drift and diffusion currents in a semiconductor.
(c) Derive expressions for drift and diffusion currents in a semiconductor.
- 5 Write short notes on the following:
(i) Magnetic bubble memory.
(ii) Hard and soft magnetic materials.
- 6 (a) Explain the phenomenon of superconductivity of a superconductor.
(b) Describe the characteristics properties of superconductors.
- 7 (a) Explain the merits and demerits of graded index optical fiber.
(b) Describe the plastic fiber structure.
- 8 (a) Describe ball milling method of synthesis of Nanomaterials.
(b) Mention the merits and demerits of ball milling method.

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ENGINEERING PHYSICS
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Answer any FIVE questions
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- 1 (a) Explain the interference of light due to thin films.
(b) What is coherent length?
- 2 (a) What is primitive cell? How does it differ from unit cell?
(b) Illustrate the SC, BCC and FCC crystal structures.
(c) Derive the expression for density of the crystal in terms of lattice constant.
- 3 (a) What are matter waves? Explain their properties.
(b) Derive the Schrodinger's time independent wave equation of an electron and write the significance of orthonormality condition of wave function.
- 4 (a) Describe the intrinsic conductivity in an intrinsic semiconductor.
(b) Derive an expression for intrinsic carrier concentration in an intrinsic semiconductor.
- 5 (a) With usual notations show that $P = \epsilon_0(\epsilon_r - 1)E$.
(b) Explain various types of possible polarizations in a dielectric.
- 6 (a) Define superconductivity and critical temperature of a superconductor.
(b) State and explain Meissner effect for a superconductor.
- 7 (a) What is the acceptance angle of an optical fiber and derive an expression for it?
(b) A fiber has a core refractive index of 1.44 and cladding refractive index of 1.4. Find its acceptance angle.
- 8 (a) Explain the vibrational properties exhibited by carbon nanotubes.
(b) Explain the basic factors of carbon nanotubes on which its vibrational properties depend.

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- 1 (a) Discuss the theory of Newton's rings with relevant diagram.
(b) Derive the expression for the diameters of dark and bright rings.
- 2 (a) Define packing fraction and show that FCC is the most closely packed one when compared to SC and BCC lattices.
(b) Iron has BCC structure with atomic weight 55.85 and density 7850 Kg/m³. Find the lattice constant.
- 3 (a) Give an account of the band theory of solids based on the Kronig-Penny model
(b) Find the least energy of an electron moving in one-dimensional potential box of width 0.05 nm.
- 4 (a) Distinguish between intrinsic and extrinsic semiconductors with suitable examples.
(b) Derive the continuity equation for electrons.
- 5 (a) Explain hysteresis of ferromagnetic material.
(b) Describe the classification of hard and soft magnetic materials based on hysteresis.
- 6 (a) Describe the important characteristics of laser beam.
(b) Explain the process of stimulated absorption of radiation along with its importance.
- 7 (a) Explain the principle of an optical fiber.
(b) Describe the fiber construction.
- 8 (a) Explain the variation of electrical properties of nanomaterials.
(b) Explain the basic principles of nanomaterials on which its electrical properties changes depend.

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ENGINEERING PHYSICS
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- 1 (a) What are the types of diffractions and give the differences between them?
(b) Obtain the condition for primary maxima in Fraunhofer diffraction due to single slit and derive an expression for width of the central maxima.
- 2 (a) Define coordination number, nearest neighbor distance, atomic radius and packing fraction.
(b) Obtain expressions for atomic radius and packing fraction for SC, BCC and FCC lattices.
- 3 (a) What are matter waves? Explain their properties.
(b) Show that for a quantum particle confined to an infinite deep potential box with finite length, the energy levels are quantized.
- 4 (a) Write notes on classification of semiconductors.
(b) Explain the effect of temperature and dopant on the Fermi level in a semiconductor.
- 5 (a) What are dielectric materials and describe the dielectric behaviour in the presence of electric field?
(b) What is dielectric constant and explain the factors on which it depends?
- 6 (a) Give the essential features of a laser beam.
(b) Explain the applications of lasers in various fields.
- 7 (a) Explain why the multimode step index optical fiber has various propagation modes than the single mode step index optical fiber.
(b) A fiber has a core diameter of $6\mu\text{m}$ and its core refractive index is 1.45. The refractive index of the cladding is 1.448. Determine the maximum number of modes allowed to propagate through the fiber, if the wavelength of light used is $1\mu\text{m}$.
- 8 (a) Explain the variation of magnetic properties of nanomaterials.
(b) Explain the basic principles of nanomaterials on which its magnetic properties changes depend.

ENGINEERING CHEMISTRY

(Common to all Branches)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) What is the role of buffer solution in EDTA titrations?
(b) Write structure of EDTA and its reaction with calcium and magnesium.
(c) Calculate temporary and permanent hardness of water sample collected in Anantapur district.
The analysis of water is as follows:
Ca (HCO₃)₂ = 16.2ppm, Mg (HCO₃)₂ = 14.6ppm, CaSO₄ = 13.6, MgSO₄ = 12ppm, MgCl₂ = 9.5.
- 2 (a) Write a note on evolution hydrogen type of corrosion with mechanism.
(b) Write a note on Inhibitors.
- 3 Explain the following terms in detail:
(a) Polymer.
(b) Degree of polymerization.
(c) Functionality.
(d) Isoprene.
- 4 Write short note on the following propellants:
(a) Initiative explosive.
(b) Low explosive.
(c) High explosive.
- 5 (a) Discuss the titration curve obtain in conductometric titration of weak acid and strong base.
(b) What are the limitations of conductometric titrations?
- 6 (a) What is a metastable equilibrium? Explain this state in water system.
(b) State the limitations of phase rule. Give applications of eutectics.
- 7 (a) With a neat diagram describe the orsats gas analysis method. What are the special precautions to be taken in the measurement?
(b) Define calorific values of a fuel. Distinguish gross and net calorific value of fuel.
- 8 (a) Outline the importance of refractories and their applications.
(b) Discuss the criteria of a good refractory material.

ENGINEERING CHEMISTRY

(Common to all Branches)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Explain the principle involved in the estimation of dissolved oxygen in water samples.
(b) Give detailed procedure for the determination of dissolved oxygen in water.
- 2 (a) Define the corrosion and explain with suitable examples.
(b) Write a note on evolution hydrogen type of corrosion with mechanism.
- 3 Write a brief account on the following:
(a) Tacticity of polymer.
(b) Functionality of polymer.
(c) Degree of polymerization.
- 4 Write a chemical equation of the following:
(a) When toluene reacts with 1:1 ratio of nitration mixture?
(b) When glycerol reacts with cool nitration mixture?
(c) When penta erithritol reacts with 3:1 ratio of nitration mixture?
- 5 Define the standard electrode potential. What are its applications?
- 6 (a) What is condensed system? Write the reduced phase rule equation.
(b) Write short notes on freezing mixtures
- 7 (a) An oil analysis gave the following results. C=85%, H=12% and O=3%. Find the weight of minimum air required for burning of 1kg of the fuel.
(b) Write a note on synthetic petrol.
- 8 (a) Define refractory. Illustrate main objective of the refractory materials.
(b) What are the various applications of refractory materials?

ENGINEERING CHEMISTRY

(Common to all Branches)

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Answer any FIVE questions
All questions carry equal marks

- 1 (a) What are the chemical reactions takes place in boiler corrosion?
(b) Write a note on scales and sludges in boilers.
- 2 (a) Explain the mechanism of dry corrosion.
(b) Write a note on galvanic corrosion.
- 3 (a) Why natural rubber needs vulcanization?
(b) Write short notes on compounding of rubber.
- 4 Explain the measurement and significance of the following properties of lubricant:
(i) Viscosity. (ii) Flash point. (iii) Fire point.
- 5 (a) Write a note on conductivity cell.
(b) What is cell Constant? How is it determined?
- 6 (a) Explain how phase rule is helpful in studying heterogeneous equilibria. What do you understand the term degree of freedom?
(b) Define the eutectic point with suitable example.
- 7 (a) Describe the method of determination of calorific value of a gaseous fuel by Junker's gas calorimeter.
(b) On burning 0.85 g of a solid fuel in a bomb calorimeter, the temperature of 3500 g of water increased from 25.60 C to 28.20 C. Water equivalent of calorimeter & latent heat of steam are 385 g & 587 cal/g respectively. If the fuel contains 0.7% of hydrogen, calculate the gross & net calorific value.
- 8 (a) Distinguish between dry and wet process of cement.
(b) What is a hardening of cement? What are the different theories to explain the hardening of cement?

Code: 9ABS103

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B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012

ENGINEERING CHEMISTRY

(Common to all Branches)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
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- 1 (a) Explain the chemical reactions takes place in the determination of dissolved oxygen.
(b) Explain the possible combinations of ions causing alkalinity in water.
- 2 (a) Differentiate chemical and electrochemical corrosion.
(b) Explain rusting of iron with the help of electrochemical theory of corrosion.
- 3 (a) Why vulcanized rubber is superior to non-vulcanized rubber? Give an account of the application of vulcanized rubber.
(b) Write a note on compounding of rubber.
- 4 Write a short note on:
(a) Cloud point and pour point.
(b) Flash point and fire point.
(c) Viscosity of a lubricant.
- 5 (a) What is meant by galvanic cell? Explain.
(b) What is EMF of a cell? How it is measured experimentally?
- 6 (a) Define the terms: Phase, component and degree of freedom with suitable examples to each.
(b) Discuss the application of phase rule to the system of water, vapor and ice.
- 7 What are the characteristics of metallurgical coke? Describe the manufacture of metallurgical coke by Ott - Hoffman's method.
- 8 (a) Describe the classification and general properties of refractories.
(b) What is Seger cone number? What is its significance? Seger cone number of two refractory materials A and B are 12 and 35 respectively. Which of these refractories possess higher refractoriness?

B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012

MATHEMATICS - I
(Common to all Branches)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
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- 1 (a) Solve : $(y^2 - 2xy)dx = (x^2 - 2xy)dy$.
(b) Solve : $(x^2 - ay)dx = (ax - y^2)dy$.
- 2 (a) Solve the differential equation: $(1+x)^2 \frac{d^3y}{dx^3} + (1+x) \frac{dy}{dx} + y = 4 \cos \log(1+x)$.
(b) Solve the differential equation $(D^3 - 1)y = e^x + \sin^3 x + 2$.
- 3 (a) Verify Rolle's theorem for $f(x) = x^2 - 5x + 6$ in $[2, 3]$.
(b) Examine if Rolle's theorem is applicable for the function $f(x) = \tan x$ in $[0, \pi]$.
- 4 (a) Find the surface area of the right circular cone generated by the revolution of a right angled triangle about a side which contains a right angle.
(b) Find the cost of plating of the front portion of the parabolic reflector of an automobile head light of 12cm diameter and 4cm deep if the cost of plating is Rs.2.00 per sq. cm.
- 5 (a) Evaluate $\iint r \sin \theta \, dr \, d\theta$ over the cardioids $r = a(1 + \cos \theta)$ above the initial line.
(b) Evaluate $\int_{-c}^c \int_{-b}^b \int_{-a}^a (x^2 + y^2 + z^2) dx \, dy \, dz$.
- 6 (a) Find the Laplace transform of: (i) $t \sin 3t \cos 2t$ (ii) $t^2 e^{-2t} \cos t$.
(b) Apply Convolution theorem to find $L^{-1} \left\{ \frac{1}{s^2(s+a)^2} \right\}$.
- 7 (a) Solve the D.E $\frac{dy}{dt} + 4y + 5 \int_0^t y dt = e^{-t}$, $y(0) = 0$. Using Laplace transform.
(b) Using Laplace transform, Evaluate $\int_0^\infty t^3 e^{-t} \sin t \, dt$.
- 8 State Stoke's theorem and verify Stoke's theorem for $\vec{F} = (x^2 + y^2)\mathbf{i} - 2xy\mathbf{j}$ taken around the rectangle bounded by the lines $x = \pm a, y = \pm b$.

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MATHEMATICS - I
(Common to all Branches)

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Answer any FIVE questions
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- 1 (a) A body initially at 80°C cools down to 60°C in 20 min. The temperature of the air is 40°C . Find the temperature of the body after 40 min.
(b) The number N of bacteria in a culture grew at a rate proportional to N . The value of N was initially 100 and increased to 332 in one hour. What was the value of N after $1\frac{1}{2}$ hours.
- 2 (a) Solve: $(D^2 + D + 1)y = x^3$.
(b) Solve: $(D^2 - 3D + 2)y = 2x^2$.
- 3 (a) Find the minimum value of $x^2 + y^2 + z^2$ given that $xyz = a^3$.
(b) Examine the function for extreme values: $f(x, y) = x^4 + y^4 - 2x^2 + 4xy - 2y^2$ ($x > 0, y > 0$).
- 4 (a) Find the surface of the solid generated by the revolution of the astroid $x^{2/3} + y^{2/3} = a^{2/3}$ about the x -axis.
(b) Find the area of the surface of revolution formed by revolving the loop of the curve $9ay^2 = x(3a - x)^2$ about the x -axis.
- 5 (a) Find $\iint (x + y)^2 dx dy$ over the area bounded by the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$.
(b) Change the order of integration in the integral $\int_{-a}^a \int_0^{\sqrt{a^2 - y^2}} f(x, y) dx dy$.
- 6 (a) If $L\{f(t)\} = F(s)$ then prove that $L\left\{\int_0^t f(t) dt\right\} = \frac{F(s)}{s}$.
(b) Find $L^{-1}\left\{\tan^{-1}\left(\frac{2}{s^2}\right)\right\}$.
- 7 (a) Using Laplace transform, show that $\int_0^{\infty} t^2 e^{-4t} \sin 2t dt = \frac{11}{500}$.
(b) Solve the D.E $y'' + n^2 y = a \sin(nt + 2), y(0) = 0, y'(0) = 0$ Using Laplace transform.
- 8 State Stoke's theorem and verify Stoke's theorem for a vector field defined:
 $\vec{F} = -y^3 \mathbf{i} + x^3 \mathbf{j}$, in the region $x^2 + y^2 \leq 1, z = 0$.

Code: 9ABS104

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MATHEMATICS - I
(Common to all Branches)

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Answer any FIVE questions
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- 1 (a) Solve the differential equation $(2x - y + 1) dx + (2y - x - 1) dy = 0$.
(b) Solve: $(hx + by + f)dy + (ax + hy + g) dx = 0$.
- 2 (a) Solve: $(D^2 + 4) y = e^x + \sin 2x + \cos 2x$.
(b) Solve: $(D^2 - 4D + 3) y = \sin 3x \sin 2x$.
- 3 (a) Find the shortest distance from origin to the surface $xyz^2 = 2$.
(b) Investigate for the maxima and minima, if any of $x^3y^2(1 - x - y)$.
- 4 (a) Trace the curve: $x^3 + y^3 = 3axy$.
(b) Trace the curve: $(a^2 + x^2)y = a^2x$.
- 5 (a) Evaluate $\int_0^1 \int_0^{x^2} e^{y/x} dy dx$.
(b) Change the order of integration and evaluate $\int_0^{4a} \int_{x^2/4a}^{2\sqrt{ax}} dy dx$.
- 6 (a) If $f(t)$ is a periodic function with period T, prove that $L\{f(t)\} = \frac{1}{1-e^{-sT}} \int_0^T e^{-st} f(t) dt$.
(b) Use Heaviside's expansion formula to find $L^{-1}\left\{\frac{1}{s^3+1}\right\}$.
- 7 (a) Find $L\{\sin \sqrt{t}\}$ and Hence Evaluate $L\left\{\frac{\cos \sqrt{t}}{\sqrt{t}}\right\}$.
(b) Solve the D.E. $y'' + 4y' + 3y = e^{-t}$, $y(0) = 1$, $y'(0) = 1$. Using L.T.
- 8 (a) If $r = x\bar{i} + y\bar{j} + z\bar{k}$, show that $\nabla r^n = nr^{n-2}\bar{r}$.
(b) Find the works done in moving in a particle in the force field $\bar{F} = (3x^2)\bar{i} + (2zx - y)\bar{j} + z\bar{k}$, along (i) the straight line from $(0,0,0)$ to $(2,1,3)$ (ii) the curve defined by $x^2 = 4y$, $3x^3 = 8z$ from $x=0$ to $x=2$.

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- 1 (a) Find the equation of the system of orthogonal trajectories of the family of curves $r^n \sin n\theta = a^n$ where a is the parameter.
(b) Find the orthogonal trajectories of the family of curves $r^n = a^n \cos n\theta$.
- 2 (a) Solve: $\frac{d^2y}{dx^2} + 4\frac{dy}{dx} + 3y = e^{2x}$.
(b) Solve: $(D^3 - 5D^2 + 8D - 4)y = e^{2x}$.
- 3 (a) Expand $x^2y + 3y - 2$ in powers of $(x - 1)$ and $(y + 2)$ up to the terms of 3rd degree.
(b) Expand $x^3 + y^3 + xy^2$ in powers of $(x - 1)$ and $(y - 2)$ using Taylor's series.
- 4 (a) Find the radius of curvature at the origin of the curve $y^2 = \frac{x^2(a+x)}{(a-x)}$.
(b) Find the radius of curvature at the origin for the curve $y^4 + x^3 + a(x^2 + y^2) - a^2y = 0$.
- 5 (a) Evaluate $\int_0^3 \int_1^2 xy(1+x+y) dy dx$.
(b) Evaluate the integral by changing the order of integration $\int_0^3 \int_1^{\sqrt{4-y}} (x+y) dx dy$.
- 6 (a) Find the Laplace transform of: (i) $e^{-3t} (2 \cos 5t - 3 \sin 5t)$. (ii) $e^{3t} \sin^2 t$.
(b) Find $L^{-1} \left\{ \frac{s^2}{(s^2+4)(s^2+9)} \right\}$ Using Convolution theorem.
- 7 (a) Solve the D.E. $y'' + 2y' - 3y = \sin t$, $y(0) = 0$, $y'(0) = 0$. Using Laplace transform.
(b) Using Laplace transform, Evaluate $\int_0^\infty e^{-4t} \frac{(2 \sin t - 3 \sinh t)}{t} dt$.
- 8 State Stoke's theorem and verify Stoke's theorem for a vector field defined:
 $\vec{F} = (2x - y)\mathbf{i} - yz^2\mathbf{j} - y^2z\mathbf{k}$, over the upper half surface of $x^2 + y^2 + z^2 = 1$, bounded by its projection on the xy -plane.

B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012

MATHEMATICAL METHODS

(Common to CSE, ECE, EEE, EIE, ECM, E.Con.E, IT & CSS)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Prove that If A and B are square matrices and if A is invertible then matrices $A^{-1}B$ and BA^{-1} have same Eigen values.
(b) Prove that the product of the Eigen values of a matrix A is equal to its determinant.
- 2 Reduce the quadratic form $q = 2x_1^2 + 2x_2^2 + 2x_3^2 + 2x_2x_3$ into a canonical form by Orthogonal reduction. Find the index, signature and nature of the quadratic form.
- 3 (a) Find and approximate value of the real root of $x^3 - x - 1 = 0$ using the bisection method
(b) Find the root of the Equation $x \log_{10}(x) = 1.2$ using false position method.
- 4 (a) Fit a second degree parabola to the following data:

x:	0	1	2	3	4
y:	1	5	10	22	38

- (b) Evaluate $\int_0^{\pi/2} e^{\sin x} dx$ correct to four decimal places by Simpson's three- eighth rule.
- 5 Using modified Euler's method, find an approximate value of y when $x = 0.3$, given that $\frac{dy}{dx} = x + y$, $y(0) = 1$.
- 6 (a) If $f(x) = |\cos x|$, Expand $f(x)$ as a Fourier series in the interval $(-\pi, \pi)$.
(b) Express $f(x) = \begin{cases} 1 & \text{for } 0 \leq x \leq \pi \\ 0 & \text{for } x > \pi \end{cases}$ as a Fourier sine integral and hence evaluate $\int_0^{\infty} \frac{1 - \cos(\pi\lambda)}{\lambda} \sin(x\lambda) d\lambda$.
- 7 A tightly stretched string with fixed end points $x = 0, x = l$ is initially at rest in its equilibrium position. If it is set vibrating by giving to each of its points a velocity $\lambda x(l - x)$, find the Displacement of the string at any distance x from one end at any time t .
- 8 (a) Find $Z \left\{ \frac{1}{n(n+1)} \right\}$.
(b) Use convolution theorem to evaluate $Z^{-1} \left\{ \left(\frac{z}{z-a} \right)^3 \right\}$.

B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012

MATHEMATICAL METHODS

(Common to CSE, ECE, EEE, EIE, ECM, E.Con.E, IT & CSS)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 Verify Cayley – Hamilton theorem for the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 5 \\ 3 & 5 & 6 \end{bmatrix}$, Hence find A^{-1} .
- 2 Reduce the following quadratic form by orthogonal reduction and obtain the corresponding transformation. Find the index, signature and nature of the quadratic form $q = 2xy + 2yz + 2zx$.
- 3 (a) Use Gauss's backward interpolation formula to find $f(32)$ given that $f(25) = 0.2707$, $F(30) = 0.3027$, $f(35) = 0.3386$, $f(40) = 0.3794$.
(b) Evaluate $f(10)$ given $f(x) = 168, 192, 336$ at $x = 1, 7, 15$ respectively, Use Lagrange interpolation.
- 4 Fit the second degree polynomial to the following data by the method of least squares
- | | | | | | |
|----|----|----|----|----|----|
| x: | 10 | 12 | 15 | 23 | 20 |
| y: | 14 | 17 | 23 | 25 | 21 |
- 5 Using Runge-Kutta method of fourth order find $y(0.1)$, $y(0.2)$ and $y(0.3)$, given that $\frac{dy}{dx} = 1 + xy$, $y(0) = 2$.
- 6 (a) Find a Fourier series to represent $f(x) = x^2 - 2$, in the interval $(-2, 2)$.
(b) Find the Fourier sine transform of $f(x) = x^{n-1}$, $(0 < n < 1)$.
- 7 A rod of length 10 cm has its ends A and B kept at 50°C and 100°C until steady state conditions prevail. The temperature at A is suddenly raised to 90°C and that at B is lowered 60°C and they are maintained. Find the temperature at a distance x from one end at time t .
- 8 (a) Define the Z-transform and prove that Z-transform is linear.
(b) Use convolution theorem to evaluate $Z^{-1}\left\{\frac{z^2}{(z-4)(z-5)}\right\}$.

B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012

MATHEMATICAL METHODS

(Common to CSE, ECE, EEE, EIE, ECM, E.Con.E, IT & CSS)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 Find the Eigen values and Eigen vectors of the matrix $A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$.
- 2 Reduce the quadratic form, $q = 3x^2 - 2y^2 - z^2 - 4xy + 12yz + 8xz$ to the canonical form by orthogonal reduction. Find its rank, index and signative. Find also the corresponding transformation.
- 3 (a) Find the unique polynomial $P(x)$ of degree 2 or less such that $P(1) = 1$, $P(3) = 27$, $P(4) = 64$ using Lagrange's interpolation formula.
(b) Find the root of the equation $x e^x = \cos x$ using the regular false method correct to four decimal places
- 4 Fit a second degree polynomial to the following data by the method of least squares.
- | | | | | | |
|----|---|-----|-----|-----|-----|
| x: | 0 | 1 | 2 | 3 | 4 |
| y: | 1 | 1.8 | 1.3 | 2.5 | 6.3 |
- 5 Using Runge-Kutta method of fourth order, solve $\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$ with $y(0) = 1$ at $x = 0.2, 0.4$.
- 6 (a) Find a Fourier series of $f(x) = x^3$ in the interval $(-\pi, \pi)$.
(b) Find the Fourier cosine transform of $f(x) = e^{-ax} \sin ax$, $a > 0$.
- 7 A tightly stretched string of length l has its ends fastened at $x = 0, x = l$. The mid-point of the string is then Taken to height 'h' and then released from rest in that position. Find the lateral displacement of a point of The string at time t from the instant of release.
- 8 (a) Find Z-transform of (i). $\frac{1}{n}$, (ii). $\frac{1}{(n+1)}$.
(b) Use convolution theorem to evaluate $Z^{-1} \left\{ \frac{z^2}{(z-1)(z-3)} \right\}$.

B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012

MATHEMATICAL METHODS

(Common to CSE, ECE, EEE, EIE, ECM, E.Con.E, IT & CSS)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Prove that the sum of the Eigen values of a matrix is the trace of the matrix.
(b) If λ is the Eigen value of A then prove that the Eigen value of $B = a_0 A^2 + a_1 I$ is $a_0 \lambda^2 + a_1$.
- 2 (a) Prove that the Eigen values of a Hermitian matrix are all real.
(b) Reduce the quadratic form $q = x_1^2 + x_2^2 + x_3^2 + 4x_1x_2 - 4x_2x_3 + 6x_3x_1$ into a canonical form by diagonalising the matrix of the quadratic form.
- 3 (a) Find the real root of $x \log_{10} x = 1.2$ correct to five decimal places by using Newton's iterative method.
(b) Given $f(2) = 10$, $f(1) = 8$, $f(0) = 5$, $f(-1) = 10$ estimate $f(1/2)$ by using Gauss's forward formula.

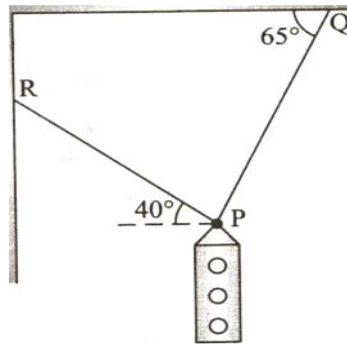
- 4 Fit a polynomial of second degree to the data points given in the following table:

x:	0	1.0	2.0
y:	1.0	6.0	17.0

- 5 Solve $\frac{dy}{dx} = 1 - y$, $y(0) = 0$ in the range $0 \leq x \leq 0.3$ by taking $h = 0.1$ by the modified Euler's method.
- 6 (a) Find a Fourier series of $f(x) = x^2$ in the interval $(-\pi, \pi)$. and deduce the value of $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \dots$.
(b) Find $f(x)$ if its Fourier sine transform is $\frac{s}{1+s^2}$.
- 7 The points of trisection of a string are pulled aside through the same distance on opposite sides of the position of equilibrium and the string is released from rest. Derive an expression for the displacement of the string at subsequent time and show that the mid-point of the string always remains at rest.
- 8 (a) Find $Z(a^n \cos n\theta)$ and $Z(a^n \sin n\theta)$.
(b) Use convolution theorem to evaluate $Z^{-1} \left\{ \frac{z^2}{(z-a)(z-b)} \right\}$.

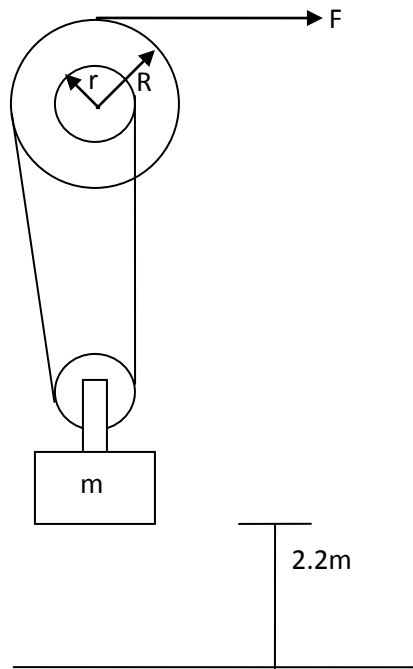
Answer any FIVE questions
All questions carry equal marks

- 1 A traffic signal of mass 50 kg is hung with the help of two strings, as shown in figure below. Find the forces induced in both the strings.

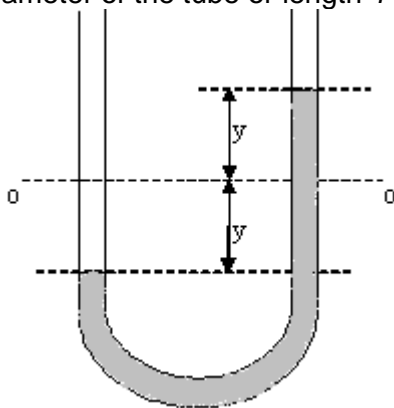


- 2 State and explain the necessary conditions of determinacy and stability for truss frame. What is simplest way to convert an unstable frame to statically determinate one?
- 3 (a) Explain the types of friction with examples.
(b) Two equal bodies A and B of weight 'W' each are placed on a rough inclined plane. The bodies are connected by a light string. If $\mu_A = 1/2$ and $\mu_B = 1/3$, show that the bodies will be both on the point of motion when the plane is inclined at $\tan^{-1} (5/12)$.
- 4 Determine the center of gravity of solid hemisphere of radius 'r' from the diametral axis.
- 5 (a) Define the terms centroid, moment of inertia and radius of gyration.
(b) Find the area moment of inertia of an equilateral triangle of side 'a' with respect to one of its side.
- 6 (a) The distance covered by a freely falling body in the last one second of its motion and the covered in the last but one second are in the ratio is 5:4. Calculate the height from which the body was dropped and the velocity with which it strikes the ground.
(b) A stationary car attains a maximum permissible speed of 80 Km/h in a distance of 40 m. It continues at this speed for a distance of 200 m and then uniform retardation brings it to a stop in 10 seconds. How far does the car travel from the starting point and what is the total elapsed time?

- 7 A differential chain-hoist system, as shown in figure has the two step upper pulley having centroidal mass moment of inertia of 13.5 NM/s^2 . The system raises very slowly a block of mass 100 kg , by means of application of a force F . Suddenly the chain slipped from the hands of the labourer and the block hits the floor 2.2 m below. Determine the velocity of hitting. Assume the chain is mass less and negligible friction in the lower pulley. Take $R = 0.31 \text{ m}$, $r = 0.16 \text{ m}$. Consider frictional torque is $1/20$ times the weight of the block.

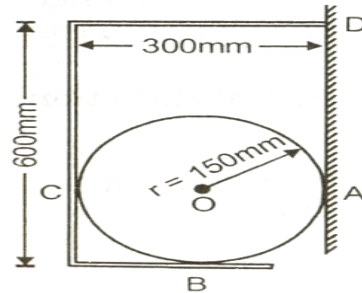


- 8 A vertical U-tube manometer contains a liquid of mass density ' ρ ' as shown in the fig. A sudden increase of pressure on the column forces the level of the liquid down. When the pressure is released, the liquid column starts vibrating. Neglecting the frictional damping, determine the period of vibration. Comment if the period is affected by changing the liquid, diameter of the tube or length ' l ' of the liquid column.



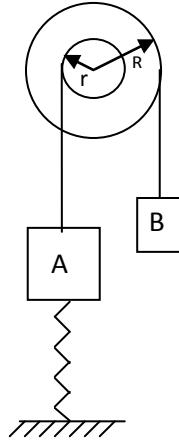
Answer any FIVE questions
All questions carry equal marks

- 1 A 600N cylinder is supported by the frame BCD as shown in figure. The frame is hinged at D. Determine the reactions at A, B, C and D.

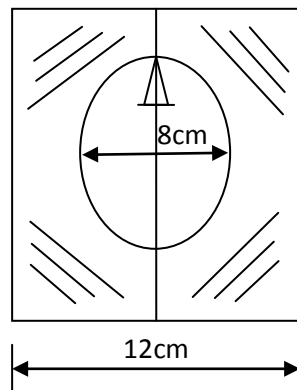


- 2 What is the difference between a truss and frame? Write down the basic assumptions for frame analysis. And discuss two methods for analyzing the frame for different forces.
- 3 A screw jack has square threads 50 mm mean diameter and 10 mm pitch. The load on the jack revolves with the screw. The coefficient of friction at the screw threads is 0.05.
i) Find the tangential force required at the end of 300mm lever to lift a load of 6000 N.
ii) State the jack is self locking. If not, find the torque which must be applied to keep the load from descending.
- 4 A steel cylinder of diameter 200 mm and height of 300mm rests centrally over a concrete rectangle of 1000 x 800 x 600 mm size. Determine the center of gravity of the system, taking weight of concrete = 28500 N/m² and that of steel 81000 N/m².
- 5 Derive the expression for mass moment of inertia of a homogeneous sphere of radius 'r' and mass density 'w', with reference to its diameter.
- 6 (a) A radar equipped police car notes a vehicle travelling at 110 Kmph. The police car starts pursuit of the vehicle 30 seconds after the observation and accelerates uniformly to 160 Kmph, in 20 seconds. Assuming that speeds are maintained on a straight road, how far from the observation point will the chase end?
(b) A train moving with constant acceleration travels 7 m during the 10th second of its motion and 5 m during the 12th second of its motion. Find its initial velocity and acceleration.

- 7 Block 'A' initially rests on a spring which is tied with a 75 cm long inextensible cord, as shown in figure. The cord becomes tight here, when the system is released from rest. Determine the stretching of the spring to bring the system at rest. The cylinder weighs 85 kg and rotates on smooth bearings. Consider $R = 0.45$ m and $r = 0.20$ m, $m_A = 75$ kg and $m_B = 40$ kg. Take spring constant $K = 1.5$ N/mm.

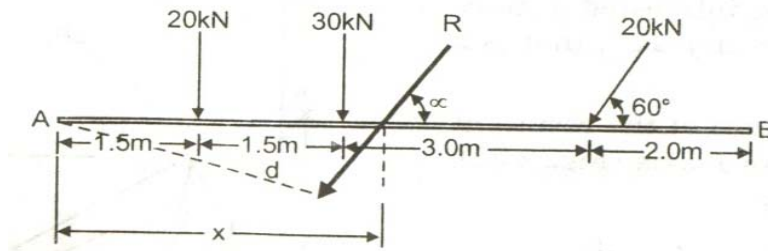


- 8 A homogeneous square plate with a centered hole is supported as a compound pendulum as shown in figure. Calculate the time period 'T' for small oscillations in the vertical plane of the plate.

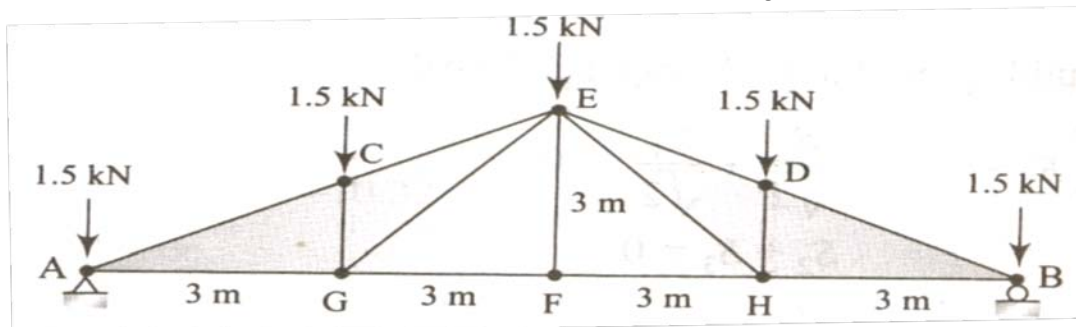


Answer any FIVE questions
All questions carry equal marks

- 1 A system of loads acting on a beam is shown in figure below. Determine the resultant of the loads.



- 2 Neglecting any horizontal components of forces in the supports, determine the axial forces in the members of Pratt roof frame as shown in the below figure.

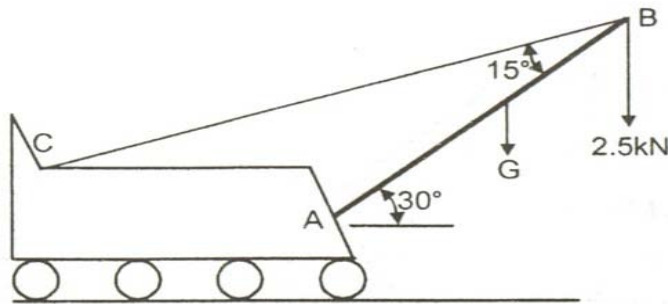


- 3 A screw jack raises a load of 40 kN. The screw is square threaded having 3 threads per 20 mm length and 40 mm in diameter. Calculate the force required at the end of a lever 400 mm long measured from axis of screw, if coefficient of friction between screw and nut is 0.12.
- 4 A steel ball of diameter 150 mm rests centrally over a concrete cube of size 150 mm. Determine the center of gravity of the system, taking weight of concrete = 25000 N/m² and that of steel 80000 N/m².
- 5 A cube of side 400 mm has mass density of 2000 kg/m³. Find out the mass moment of inertia of the cube about one of its edges and also about its centroidal axis parallel to one of its sides.

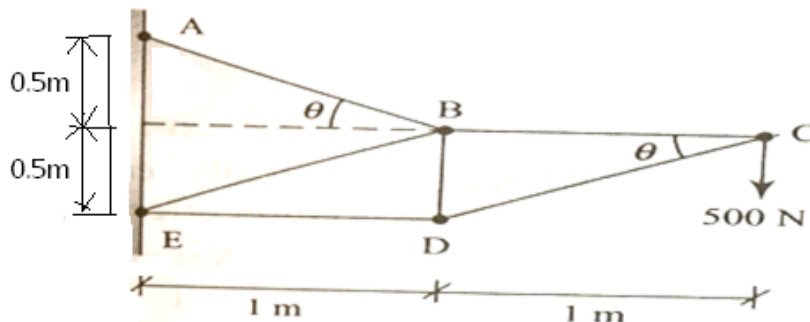
- 6 An enemy ship was located at a distance of 25 km in north – west direction by a warship. If the enemy ship is moving with a velocity of 18 kmph N 30° E, in which direction the warship must move with a velocity of 36 kmph to strike at its earliest. Assume the fire range of warship is 5 km. When is the shell to be fired?
- 7 (a) An automobile moving with a uniform velocity of 40 kmph is accelerated by increasing the traction force by 20%. If the resistance to motion is constant, find the distance traveled before it acquires 50 kmph. Use work-energy method.
- (b) A solid cylinder and a sphere are started top of an inclined plane, at the same time, and both roll without slipping down the plane. If when the sphere reaches the bottom of incline, the cylinder is 12 m behind it, what is the total length 'S' of the incline.
- 8 A particle with a simple harmonic motion has amplitude of 375 mm and a period of $\pi/2$ sec. Find the velocity and acceleration of the particle when it has traveled 225 mm to the right of the center of its path. What time is required for this displacement?

Answer any FIVE questions
All questions carry equal marks

- 1 The 12 m beam AB weighs 1 kN, the distance of the center of gravity G being 6 m from A. For the position shown, determine the tension T in the cable and the reaction at B [show in figure below]

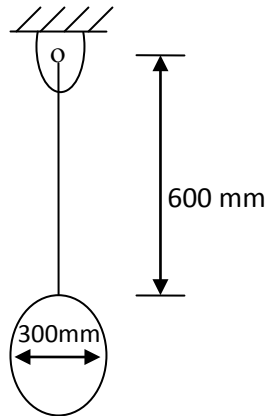


- 2 Determine the axial forces in the members of plane frame as shown in the below figure.



- 3 A block weighing 100 N is resting on a rough plane inclined 20 degrees to the horizontal. It is acted upon by a force of 50 N directed upward at angle of 14° above the plane. Determine the friction. If the block is about to move up the plane, determine the co-efficient of friction.
- 4 (a) Determine the centroid of the quarter circle whose radius R.
(b) Determine centroid of semicircle whose radius R.
- 5 A cylinder of diameter 500 mm and height 1200 mm has mass density of 8000 kg/m^3 . Find out the mass moment of the inertia of the cylinder: (a) with respect to the axis of the cylinder and (b) about a line, which coincides with an end face of the cylinder and passing through center of this face.

- 6 (a) A stone dropped into well is heard to strike the water in 3.5 sec. Find the depth of the well assuming the velocity of the sound is 335 m/sec.
(b) Maximum range of a field gun is 2000 m. If a target at a distance of 1200 m is to be hit, what should be the angle of projection.
- 7 (a) State the principle of the conservation of momentum.
(b) A golfer hits a 46 g ball with an initial velocity of 48 m/sec at an angle of 24° with the horizontal. Determine: (i) The initial KE of the ball. (ii) The KE of the ball when it reaches its maximum height.
- 8 The compound pendulum shown in figure consists of a slender rod of 600 mm long weighing 30 N to which is attached a solid circular disc of 300 mm diameter that weighs 40 N. Compute the period of oscillation.



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B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012

ENGINEERING DRAWING

(Common to ECE, E.Con.E & BT)

Time: 3 hours

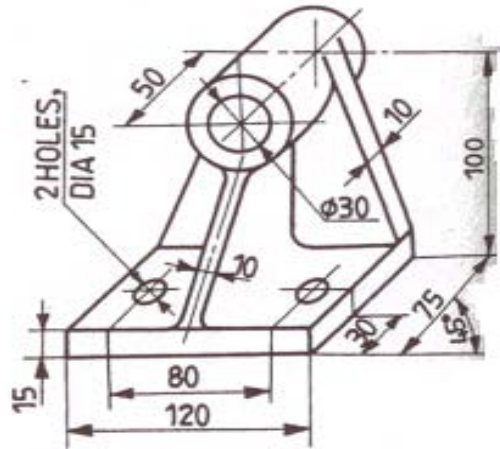
Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) A ball thrown up in the air reaches maximum height of 45 meters and travels a horizontal distance of 75 metres. Trace the path of the ball, assuming it to be parabolic.
(b) Inscribe an ellipse in a parallelogram having sides 150 mm and 100 mm long and an included angle of 120° .
- 2 (a) A line AB of 100 mm length is inclined at an angle of 30° to HP and 45° to VP. The point A is 15 mm above HP and 20 mm in front of VP. Draw the (i) front view (ii) top view.
(b) A line AB of 100 mm length is inclined at 30° to HP and 45° to VP. The point A is 15 mm above HP and 20mm in front of VP. Draw the projections of the line.
- 3 (a) Draw the projections of a pentagonal plane figure of side 28 mm resting with one of its edges on HP. Such that the plane figure is inclined at 30° to VP perpendicular to HP.
(b) A thin square plate ABCD of side 40 mm is perpendicular to both HP and VP. Draw its projections.
- 4 (a) A hexagonal prism has one of its rectangular faces parallel to the H.P. its axis is perpendicular to the V.P. and 3.5 cm above the ground.
(b) Projection of cylinder 60 mm diameter and 90 mm long. Axis inclined at 45° to H.P. and parallel to V.P.
- 5 (a) Draw the projection of a cylinder of 40 mm diameter and axis 60 mm long, when it is lying on HP, with its axis inclined at 45° to HP and parallel to VP.
(b) Draw the projections of a cone of diameter of base 40 mm and axis 60 mm long, when it is lying on a point of the base on HP, with its axis inclined at 45° to HP and perpendicular to VP. Follow the auxiliary method.

Contd. in Page 2

- 6 Convert the bracket shown in the pictorial view below into orthogonal projections of three views.



- 7 A square prism of base 50 mm side and height 125 mm stands on the ground with a side of the base inclined at 30° to the V.P. It is penetrated by a cylinder, 50 mm diameter and 125 mm long, whose axis is parallel to both the H.P. and the V.P. and bisects the axis of the prism. Draw the projections showing fully the curves of intersection.
- 8 A hexagonal plane with a 40 mm side has a centrally cut square hole with a 30 mm side such that a side of the hole and a side of the hexagon are parallel PP. It lies on the GP with a nearer edge of the hexagon 10 mm behind the PP. The station point is 50 mm in front of PP, 70 mm above GP and lies in a CP which is at a distance of 40 mm towards right of the centre of the object. Draw its perspective view.

B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012

ENGINEERING DRAWING

(Common to ECE, E.Con.E & BT)

Time: 3 hours

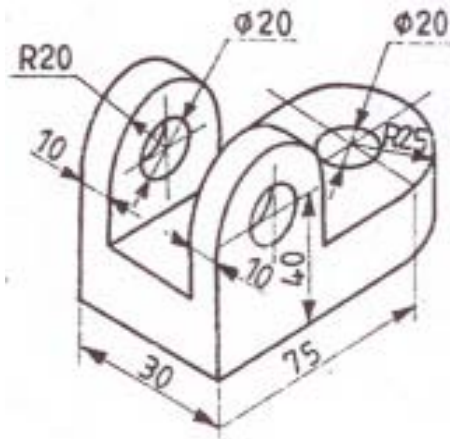
Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Two points A & B are 100 mm apart. A point C is 75 mm from A and 60 mm from B. Draw the ellipse passing through A, B and C.
(b) A ball thrown up in the air reaches maximum height of 45 metres and travels a horizontal distance of 75 metres. Trace the path of the ball, assuming it to be parabolic.
- 2 (a) A line AB, 65 mm long has its end A in the H.P. and 15 mm in front of the V.P. The end B is in the third quadrant. The line is inclined at 30° to the H.P. and at 60° to the V.P. Draw its projections.
(b) A line PQ 75 mm long has its end P in both HP and VP. It is inclined at an angle of 30° to HP and 45° to VP. Draw projections of the line.
- 3 (a) Draw the projections of a circle of 50 mm diameter resting in the H.P. on a point A on the circumference, its plane inclined at 45° to the H.P. and the top view of the diameter AB making 30° an angle with the V.P.
(b) A thin rectangular plate of side's 60 mm X 30 mm has its shorter side in the V.P. and inclined at 30° to the H.P. Project its top view if its front view is a square of 30 mm long sides.
- 4 (a) Draw the projections of a hexagonal prism of side of base 25 mm and height 50 mm resting with its base on H.P. such that one of its rectangular faces is perpendicular to V.P.
(b) Square pyramid base 40 mm side, axis 65 mm long has base in V.P. one edge of base inclined to 30° to H.P. and corner contained by that edge is on H.P. Draw its projections.
- 5 (a) A right circular cone of 50 mm base diameter and of altitude 60 mm is lying on one of the generator on HP, such that the axis of the cone is parallel to VP it is cut by a section plane to HP and perpendicular to VP and 30 mm above HP. Show the sectional plan and elevation of the solid.
(b) A sphere of 60 mm diameter is cut by a section plane perpendicular to the VP, inclined at 45° to the HP and at a distance of 15 mm from its centre. Draw the sectional plan and true shape of section.

Contd. in Page 2

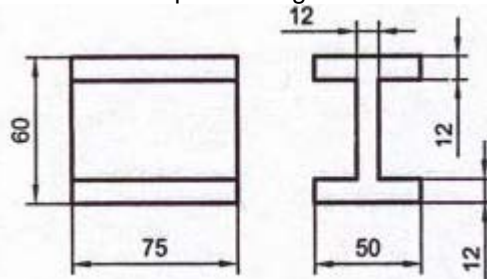
- 6 Draw the elevation, plan and left and right side views of the bracket shown in the picture below (dimensions in mm)



- 7 A cylinder of 75 mm diameter and 125 mm height stands on its base on the ground. It is penetrated centrally by a cylinder, 50 mm diameter and 125 mm long, whose axis is parallel to the H.P. but inclined at 30° to the V.P. Draw the projections showing curves of intersection. Draw also the development of the penetrated cylinder.
- 8 Draw a perspective view of a hexagonal prism having a base with a 40 mm side and a 60 mm long axis, resting on its base in the GP with a side of base parallel to and 10 mm behind the PP. The station point is 50 mm in front of PP, 75 mm above GP and lies in a CP which is 50 mm towards the right of the axis.

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Construct a parabola with the length of base as 60 and axis 30 long. Also draw a tangent to the curve at a point 25 from the base.
(b) The major and minor axes of an ellipse are 120 & 80 mm. draw an ellipse by arcs of circles method.
- 2 (a) Draw the projections of a line CD 50 mm long, parallel to HP and inclined to VP. The end of C is 10 mm in front of VP and D is 30 mm in front of VP. The line is 15 mm above HP.
(b) A line AB is 75 mm long. A is 50 mm in front of VP and 15 mm above HP. B is 15 mm in front of VP and is above HP. Top View of AB is 50 mm long. Draw and measure the front view. Find the true inclinations.
- 3 (a) A triangular lamina of 50 mm side, is standing on one of its sides, which is inclined 45° to VP and surface of the lamina is making an angle of 30° to HP. Draw its projections
(b) A regular pentagonal plate of side 28 mm is placed with one side on HP such that the surface is inclined at 45° to HP and perpendicular to VP. Draw its projections.
- 4 (a) A cube of 30 mm long edges lies with one of its square faces on H.P. Such that one of its vertical faces is inclined at 30° to V.P. Draw its projections.
(b) Draw the projections of a regular pentagonal prism side of base 30 mm and axis 55 mm resting with its base on H.P. such that one of its rectangular faces is perpendicular to V.P.
- 5 A pentagonal prism, side of base 50 mm and length 100 mm has a rectangular face on the H.P. and the axis parallel to the V.P. It is cut by a vertical section plane, the H.T. of which makes an angle of 30° with xy and bisects the axis. Draw the sectional front view, top view and true shape of the section. Develop the surface of the remaining half of the prism.
- 6 Two views of a piece are given below. Draw the isometric view of the piece (dimensions are in mm)



- 7 Two circular pipes of 75 mm and 50 mm diameters (inside) meet at 30° . The axes of both the pipes are in one plane and the 75mm pipe is vertical. The thickness of the pipes is 6 mm in both cases. Draw the projections showing curves of intersection.
- 8 A frustum of a square pyramid, base 28 mm side, top 22 mm side and 36 mm height is resting on its base on the GP such that the sides of base are equally inclined to the picture plane. The axis of the frustum is 30 mm to the right of the station point. The station point is 45 mm in front of the PP and 50 mm above the GP. The nearest base corner is 10 mm behind the PP. Draw the perspective projection.

ENGINEERING DRAWING
(Common to ECE, E.Con.E & BT)

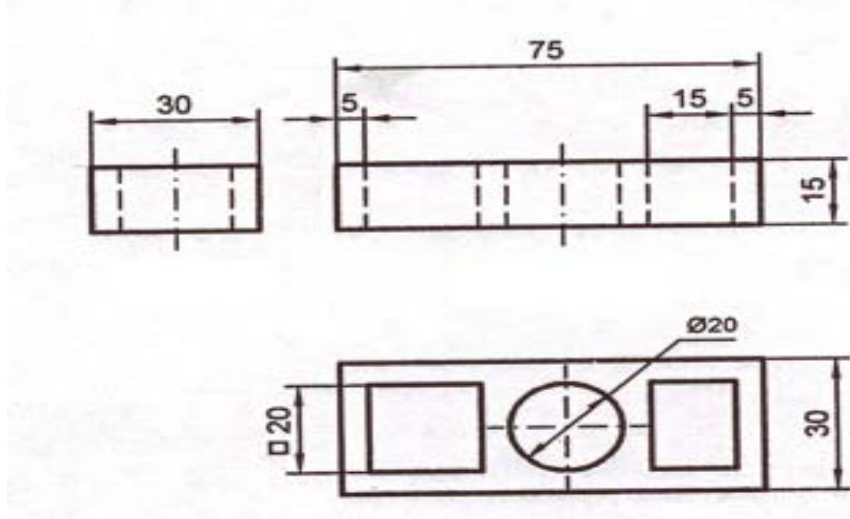
Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) The asymptotes of a hyperbola are inclined at 70° to each other. Construct the curve when a point p on it is at a distance of 20 and 30 from the two asymptotes.
(b) The major axis of an ellipse is 120 long and the foci are at a distance of 20 from its ends. Complete the ellipse and draw a tangent at a distance of 35 from focus.
- 2 (a) A 90 mm long line is parallel to and 25 mm in front of the V.P. It's one end is in the H.P. while other ends 50 mm above the H.P. respectively. Draw the projections of the line and determine its inclination with the H.P.
(b) The length of the top view of a line parallel to the V.P. and inclined at 45° to the H.P. is 5 cm. One end of the line is 1.2 cm above the H.P. and 2.5 cm in front of the V.P. Draw the projections of the line and determines its true length.
- 3 (a) A square plane ABCD of side 30 is parallel to H.P. and 20 away from it. Draw its projections of the plane:
(i) parallel to V.P.
(ii) inclined at 30° to V.P.
(b) A regular pentagon of 30 mm side has one of its corners on VP and Its surface is inclined at 60° to VP .The edge, opposite to corner on VP, makes an angle of 45° with HP .draw the projections of the plane.
- 4 (a) A rectangular prism side of base 40 mm X 25 mm and height 60 mm rests with its base on H.P. such that one of its larger rectangular faces is parallel to V.P. Draw its projections.
(b) A cube of 40 mm side rests with one of its square faces on H.P. such that one of its vertical faces is perpendicular to V.P. Draw its projections.
- 5 A hollow square prism, base 50 mm side (outside), length 75 mm and thickness 9 mm is lying on the h.P. on one of its rectangular faces, with the axis inclined at 30° to the V.P. A section plane, parallel to the V.P. cuts the prism, intersecting the axis at a point 25 mm from one of its ends. Draw the top view and sectional front view of the prism.

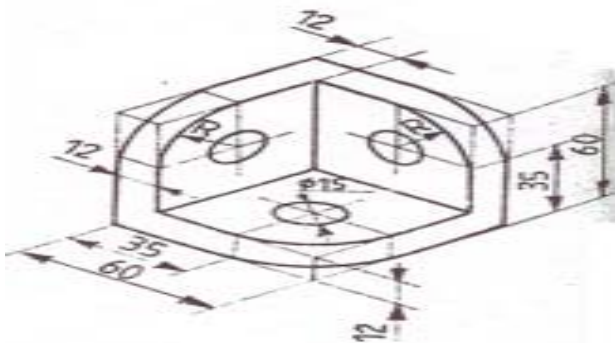
- 6 Three views of a model are given below. Draw the isometric view of the model (dimensions are in mm)



- 7 A right circular cylinder of 75 mm diameter penetrates another of 100 mm diameter, their axes being at right angles to each other but 10 mm apart. Draw the projections of the curves of intersection on a plane parallel to the axes of the cylinders.
- 8 Draw a perspective view of a pyramid having base with a 50 mm side and a 70 mm long axis, resting on its base in the GP with its axis at a distance of 40 mm behind the PP and all the edges of the base equally inclined to it. The station point is 55 mm in front of PP, 70 mm above GP and lies in a CP which is 40 mm towards right of the axis.

Answer any FIVE questions
All questions carry equal marks

- 1 (a) To construct a pentagon length of a side is 30 mm.
(b) To draw an arc passing through three points not in straight line.
(c) Construct a parabola, with the distance of the focus from the directrix as 50 mm, also draw normal and tangent to the curve at a point 40 from the directrix.
- 2 (a) A line PQ, 9 cm long is in the H.P and makes an angle of 30 degrees with the V.P its end P is 2.5 cm in front of the V.P. Draw its projections.
(b) A 100 mm long line is parallel to and 40 mm above the H.P. Its two ends are 25 mm and 50 mm in front of the V.P. respectively. Draw the projections of the line and determine its inclination with the V.P.
- 3 (a) A square lamina ABCD of 50 mm side is perpendicular to V.P and parallel to H.P. It is 20 mm above H.P and 30 mm in front of V.P. Draw its projections
(b) A square lamina of 40 mm side has a corner on H.P. and 20 mm In front of V.P. All sides are equally inclines to H.P and parallel to V.P.
- 4 (a) A square prism, side of base 35 mm and height of 50 mm rests with its base on H.P. such that one of its rectangular faces is inclined at an angle of 30° to V.P. Draw its projections.
(b) Draw the projections of a square pyramid having one of its triangular faces in the V.P. and the axis parallel to and 40 mm above the H.P. Base 30 mm side axis 75 mm long.
- 5 A cylinder, 65 mm diameter and 90 mm long have its axis parallel to the H.P. and inclined at 30° to the V.P. It is cut by a vertical section plane in such a way that the true shape of the section is an ellipse having the major axis 75 mm long. Draw its sectional front view and true shape of the section.
- 6 Draw the elevation, plan and left and right side views of the bracket shown in the picture below (dimensions in mm).



- 7 Two equal prisms, whose ends are equilateral triangles of 40 mm side and axes 100 mm long, intersect at right angles. One face of each prism is on the ground. The axis of one of the prisms makes 30° with the V.P. Draw three views of the solids.
- 8 A circular lamina of diameter 50 cm is lying on the ground plane touching the picture plane. The station point is 50 cm above the ground plane, 60 cm in front of the picture plane and contained in the central plane which passes at a distance of 40 cm from the center of the circle. Draw the perspective projection of the circle.

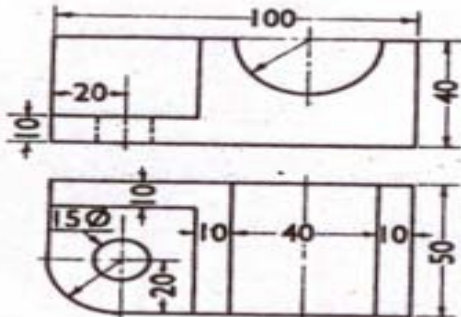
ENGINEERING DRAWING
(Common to CSE, CSSE & CE)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) A circle of 75 mm diameter rolls on another circle of 115 mm diameter with internal contact. Draw the locus of a point on the circumference of the rolling circle for its one complete revolution.
(b) Draw the involute of an equilateral triangular of side 20 mm.
- 2 (a) Draw the projections of a line CD 30 mm long, parallel to HP and inclined to VP. The end C is 10 mm in front of VP and D is 20 mm in front of VP. The line is 15 mm above HP. Also find the traces.
(b) A line RS 40 mm long is parallel to both planes. It is 20 mm above HP and 15 mm in front of VP. Draw projections and its traces.
- 3 (a) A circular plate is parallel to H.P Its radius is 30 mm and center is 50 mm above and 20 mm in front of V.P. Draw its projections of planes.
(b) A regular pentagon of 25 mm side has one of its edges on V.P its plane is inclined at 45° to V.P. Draw its projections.
- 4 (a) Pentagonal prism base 30 mm side and axis 60 mm long has an edge of its base in H.P. axis is inclined at 45° to ground and parallel to V.P.
(b) Projection of a cone, base 75 mm diameter and axis 100 mm long lying on H.P. with its axis parallel to V.P. and inclined at 30° to H.P.
- 5 A cube of 65 mm long edges has its vertical faces equally inclined to the V.P. it is cut by a section plane, perpendicular to the V.P., so that the true shape of the section is a regular hexagon. Determine the inclination of the cutting plane with the H.P. and draw the sectional top view and true shape of the section.
- 6 Two views of a casting are shown below. Draw the isometric view of the casting (dimensions are in mm)



- 7 A cylinder of 60 mm diameter and 100 mm height stands on its base on the ground. It is penetrated centrally by a cylinder of 40 mm diameter and 100 mm long, whose axis is parallel to HP, but inclined at an angle of 30° to VP. Draw the projections showing the curves of intersection. Also draw the development of the penetrating cylinders.
- 8 A cylinder of base 50 mm diameter and axis 75 mm long has a coaxial square hole of 25 mm side. The cylinder is resting on the ground, with its base parallel to PP and 10 mm behind it. The faces of the hole are equally inclined to GP. The station point is 50 mm to the left of the axis of the solid, 45 mm in front of PP and 70 mm above GP. Draw the perspective projection of the solid.

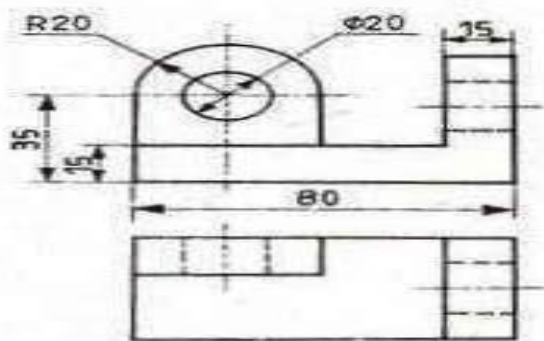
ENGINEERING DRAWING
(Common to CSE, CSSE & CE)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Draw a hypo-cycloid of a circle of 40 diameters, which rolls inside another circle of 160 diameters, for one revolution counter clockwise.
(b) Draw the involute of a regular hexagon of side 20. Draw a tangent and normal to the curve at a distance of 100 from the center of the hexagon.
- 2 (a) A line AB, 75 mm long, is inclined at 45° to the H.P. and 30° to the V.P. its end B is in the H.P. and 40 mm in front of the V.P. Draw the projections.
(b) A line AB is 30 mm long and inclined at 30° to VP and parallel to HP. The end A of the line is 15 mm above HP and 20mm in front of VP. Draw the projections
- 3 (a) A square lamina of 50 mm side is inclined at 45° to V.P and parallel to H.P Draw its projections.
(b) An equilateral triangle lamina of side 30 mm parallel to H.P. and to V.P .One of its side is 20 mm in front of V.P. and 30 mm above H.P .Draw its projections.
- 4 (a) Draw the projections of a triangular prism base 40 mm side and axis 50 mm long, resting on one of its bases on the H.P. with a vertical face perpendicular to the V.P.
(b) Draw the projections of a pentagonal pyramid axis 60 mm long, base 30 mm side having base on the ground and one of edges of base inclined at 45° to V.P.
- 5 A vertical hollow cylinder, outside diameter 60 mm, length 85 mm and thickness 9 mm is cut by two section planes which are normal to the V.P. and which intersect each other at the top end of the axis. The planes cut the cylinder on opposite sides of the axis and are inclined at 30° and 45° respectively to it. Draw the front view sectional top view and auxiliary sectional top views on planes parallel to the respective section planes.
- 6 Two views of a bracket are given below. Draw the isometric view of the bracket (dimensions are in mm)



- 7 A square prism of base 50 mm side and height 125 mm stands on the ground with its side of base inclined at an angle of 30° to VP. It is penetrated by a cylinder of diameter 50 mm and axis 125 mm long. The axis of the cylinder is parallel to both HP and VP and bisects the axis of the prism. Draw the projection showing fully the curves of intersection.
- 8 A man of 1.8m height stands at a distance of 5 m from a flight of four stone steps having a width of 2m, tread 0.3m and rise 0.2m. The flight makes an angle of 45° with the PP and touches the same at a distance of 2 m to the right of the center of vision. Draw the perspective projection of the flight.

B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012

ENGINEERING DRAWING
(Common to CSE, CSSE & CE)

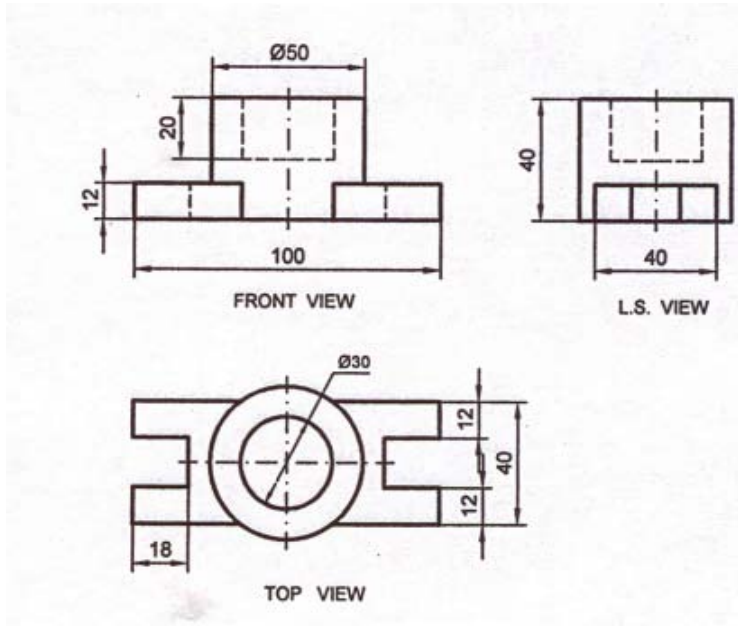
Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) A circle of diameter 40 mm rolls inside another circle of radius 60 mm. draw the hypo cycloid traced by a point on the rolling circle initially in contact with the directing circle for one revolution.
(b) A circle of 50 mm diameter rolls along a line for one revolution clock-wise. Draw the locus of the point on the circle, which is in contact with the line.
- 2 (a) A line AB of 70 long is parallel to and 25 mm in front of VP. it's one end is on HP while the other end is 40 mm above HP. Draw the projections of the line and determine the inclination with HP .
(b) A line AB is on HP and its one end A is 20 in front of VP. The line makes an angle of 45° with VP. And its front view is 60 long. Draw the projections of the line and determine the true length.
- 3 (a) A square ABCD of 50 mm side has its corners A in H.P its diagonal AC is inclined at 30° to H.P and the diagonal BD is inclined at 45° to V.P and parallel to H.P .Draw its projections.
(b) A thin 30° - 60° set square has its longest edge in V.P and inclined at 30° to H.P. Its surface makes an angle of 45° with V.P. Draw its projections.
- 4 a Draw the projections of cylinder of base 40 mm diameter, axis 50mm long, resting on ground on its base.
b Draw the projections of a hexagonal pyramid axis 60 mm long, base 30 mm side having base on the ground and one of edges of base inclined at 45° to V.P.
- 5 A square pyramid, base 50 mm side and axis 75 mm long, is resting on the H.P. on one of its triangular faces, the top view of the axis making an angle of 30° with the V.P. it is cut by a horizontal section plane, the V.T. of which intersects the axis at a point 6mm from the base. Draw the front view, sectional top view and the development of the sectioned pyramid.

- 6 Three views of a machine part are shown below. Draw the isometric view of the part (dimensions are in mm)



- 7 A cylinder of 60 mm diameter and axis 80 mm long is standing on its base on HP. A horizontal rectangular hole of 35 mm x 25 mm sides is cut through the cylinder. Axis of the hole is parallel to VP. The axes of both cylinder and hole intersect at right angles and bisect each other. Draw the projections and show the curves of intersection.
- 8 Draw the respective projection of a rectangular block of 3 m x 2 m x 1.5 m resting on a horizontal plane with one side of the rectangular plane making an angle of 45° with VP. The observer is at a distance of 6 m from the picture plane. Assume eye level as 1.5 m.

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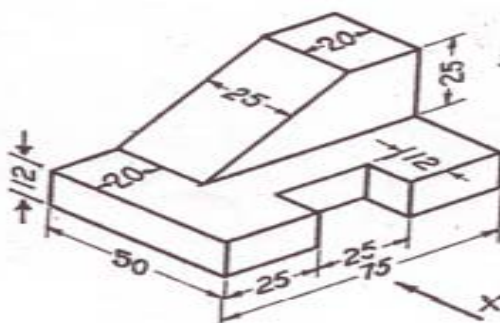
ENGINEERING DRAWING
(Common to EEE, ECM & AE)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Draw a cycloid formed by a rolling circle 50 mm in diameter. Use 12 divisions. Draw a tangent and a normal at a point 30mm above the directing line.
(b) A point P is 30 mm and 50 mm respectively from two straight lines which are at right angles to each other. Draw the rectangular hyperbola from p within 10 mm distance from each line.
- 2 The front view of a 125 mm long line PQ measures 75 mm and its top view measures 100 mm. Its end Q and the mid-point M are in the projections of a line PQ.
- 3 (a) A square of 30 mm side has one side on HP. Its plane is inclined at 60° to HP and perpendicular to VP. Draw the projections.
(b) A square lamina of 45 mm side has a corner on H.P and 25 mm in front of VP. All the sides of the square are equally inclined to HP and parallel to VP. Draw the front and top views
- 4 (a) A square prism side of base 30 mm and axis 50 mm long, has an edge of its base in H.P. its axis is inclined at 60° to H.P. and parallel to V.P. Draw its projections.
(b) A square prism side of base 40 mm and axis 60 mm long, rests with one of its base corners on H.P. its base makes an angle of 45° to H.P and its axis is parallel to V.P. Draw its projections.
- 5 (a) A hexagonal pyramid side of the base 30 mm and altitude 70 mm rests with its base on HP and with a side of the parallel to VP. It is cut by a cutting plane inclined at 35° to HP and perpendicular to VP and is bisecting the axis. Draw the sectional plan of the pyramid and the true shape of the section.
(b) A cylinder of base diameter 45 mm and height 65 mm rests on its base on HP. It is cut by a plane perpendicular to VP and inclined at 30° to HP and meets the axis at a distance 30 mm from base. Draw the front view, sectional top view, and the true shape of section.
- 6 Draw the elevation, plan and left and right side views of the part shown in the picture below (dimensions in mm).



- 7 A vertical cylinder with a 60 mm base diameter rests on its base on the H.P. It is penetrated by a horizontal cylinder of same diameter such that their axes bisect each other at right angles. Draw their three views and show the curves of intersection.
- 8 A rectangular plane with 60 mm and 40 mm sides is lying in the GP with the longer side parallel to and 15 mm behind the PP. The station point is 50 mm in front of the PP, 60 mm above GP and lies in the CP passing through the centre of the object. Draw its perspective view.

B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012

ENGINEERING DRAWING
(Common to EEE, ECM & AE)

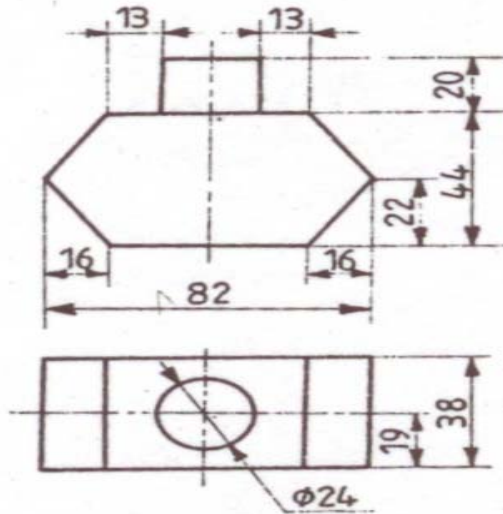
Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) A circle of 40mm diameter rolls on a straight line without slipping. In the initial position, the diameter PQ of the circle is parallel to the line on which it rolls. Draw the locus of the points P and Q for one complete revolution of the circle.
(b) Draw the curve traced out by the end of the thick wire unwound from an equilateral triangle of side 20 mm, the wire being kept tight.
- 2 The end A of a line AB is in the H.P. and 25 mm behind the V.P. The end B is in the V.P. and 50 mm above the H.P. The distance between the end projectors is 75 mm. Draw the projections of AB and determine the true length, inclinations with two planes.
- 3 (a) Draw the projections of regular pentagon of 40 mm side, having its surface inclined at 30° to VP and the side on which it rests on VP, makes an angle of 60° with HP.
(b) Draw the orthographic views of a regular hexagonal lamina of 25 mm side, resting on HP on one of its sides with its plane perpendicular to HP and inclined at 45° to VP. Take the nearest corner point 25 mm away from VP.
- 4 (a) A hexagonal pyramid, side of base 25 mm and axis 50 mm long, rests with one of the edges of its base on H.P and its axis is inclined at 30° to H.P and parallel to V.P. Draw its projections.
(b) A pentagonal prism side of base 25 mm and axis 50 mm long rests with one of its shorter edges on H.P. Such that the base containing that edge makes an angle a 30° to H.P. and its axis is parallel to V.P. Draw its projections.
- 5 (a) A cone of base diameter 50 mm and axis length 75 mm in resting on HP on its base is cut by a plane inclined at 45° to HP and perpendicular to VP and is bisecting the axis. Draw the front view and sectional top view and true shape of this section.
(b) A pentagonal prism of base side 30 mm and axis length 60 mm is resting on HP on one of its rectangular faces, with its axis is perpendicular to VP. It is cut by a plane inclined at 40° to VP and perpendicular to HP and passing through a point 25 mm from rear base of the prism. Draw its top view, sectional front view and true shape of section.

- 6 Two views of a casting are shown below. Draw the isometric view of the casting (dimensions are in mm)



- 7 A cylinder 30 mm diameters and axis 40 mm long is lying on the ground plane with its axis perpendicular to the picture plane. The nearest point of contact with the ground is 60 mm on the left of the station point and 10 mm from the picture plane. The station point is 40 mm above the ground and 60 mm in front of the PP. Draw the perspective projection of the cylinder.
- 8 Draw the perspective view of a pentagonal plane with a 30 mm long side perpendicular to the PP. It placed on GP with its centre 50 mm behind PP. The station point is 50 mm in front of the PP, 65 mm above GP and lies in a CP which is 50 mm to the right of the centre of the pentagon.

Code: 9A03101c

3

B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012

ENGINEERING DRAWING
(Common to EEE, ECM & AE)

Time: 3 hours

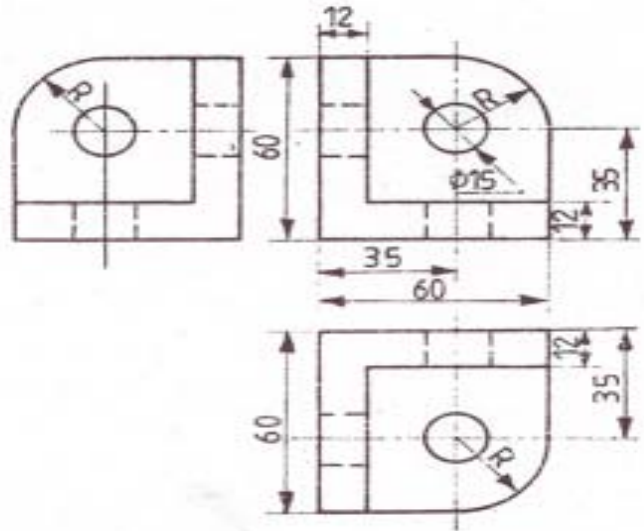
Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) A circle of 75 mm diameter rolls on another circle of 115 mm diameter with internal contact. Draw the locus of a point on the circumference of the rolling circle for its one complete revolution.
(b) Draw the involute of an equilateral triangular of side 20 mm.
- 2 A line LM 70 mm long has its end L 10 mm above Hp and 15 mm in front of VP. The top and front views measure 60 mm and 40 mm respectively. Draw projections of the line. Find its inclinations with HP and VP.
- 3 (a) A circular lamina of 42 mm diameter has its surface parallel to HP and perpendicular to VP. Its center is above 15 mm HP and 30 mm in front of VP. Draw its projections.
(b) An equilateral triangular lamina of side 50 mm is perpendicular to both planes. Draw its projections.
- 4 (a) A hexagonal prism side of base 20 mm and axis 60 mm long lies with one of its rectangular faces on H.P. such that its axis is parallel to both H.P. & V.P.
(b) A hexagonal pyramid, side of base 25 mm and height 50 mm rests with its base on H.P. such that one of the edges of the base is inclined at 20° to V.P. Draw the top and front views of the pyramid.
- 5 (a) A cone of base diameter 50 mm and axis length 60 mm is resting on HP on its base. It is cut by a plane inclined at 40° to VP and perpendicular to HP that cuts the cone at distance 10 mm from the axis and in front of it. Draw its top view, sectional front view and true shape of section.
(b) A square pyramid of base side 30 mm and axis length 60 mm is resting on HP on its base with a side is inclined at 30° to VP. It is cut by a plane perpendicular to both HP and VP and is 10 mm away from the axis. Draw its top view, front view and sectional side view.

Contd. in Page 2

- 6 Three views of a casting are shown below. Draw the isometric view of the casting (dimensions are in mm).



- 7 A vertical square prism, base 50 mm side has its faces equally inclined to the V.P. It is completely penetrated by another square prism of base 30 mm side, the axis of which is parallel to both the planes and is 6 mm away from the axis of the vertical prism. The faces of the horizontal prism also are equally inclined to the V.P. Draw the projections of the solids showing lines of intersection.
- 8 Draw the perspective projection of a cube of side 45 mm resting on the ground plane on its base with all the vertical faces equally inclined to the picture plane. One vertical edge is touching the picture plane and is 15 mm to the left of the station point which is 70 mm above the ground and 55 mm in front of the picture plane.

Code: 9A03101c

4

B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012

ENGINEERING DRAWING
(Common to EEE, ECM & AE)

Time: 3 hours

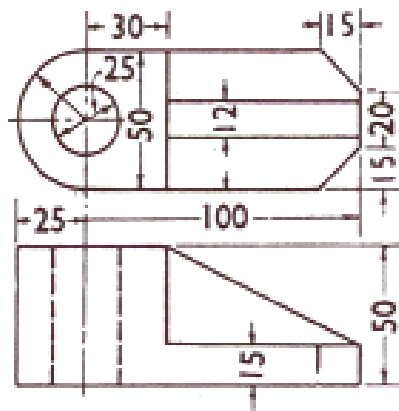
Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Draw a hypo-cycloid of a circle of 40 mm diameter, which rolls inside another circle of 160 mm diameter, for one revolution counter clockwise.
(b) Draw the involute of a regular hexagon of side 20 mm. Draw a tangent and normal to the curve at a distance of 100 mm from the center of the hexagon.
- 2 (a) A line CD measures 80mm is inclined at an angle of 30° to HP and 45° to VP. The point C is 20 mm above HP and 30 mm in front of VP. Draw the projections of the line.
(b) Draw the projections of a line JK 70 mm long and touching both HP and VP. It is inclined at 40° to HP and 35° to VP.
- 3 Draw the projections regular pentagon of 40 mm side, having its surface inclined 30° to HP and a side parallel to the HP. And inclined at angle of 60° to VP.
- 4 (a) A cylinder base 35 mm diameter and axis 60 mm long lies with one of its generators on H.P. such that its axis is parallel to both H.P. & V.P.
(b) Draw the projections of cube of 40 mm side, resting with a face on H.P. such that one of its vertical faces is inclined at 30° to V.P.
- 5 (a) A cone of base diameter 50 mm and axis length 60 mm is resting on HP on its base. It is cut by a perpendicular to HP and parallel to VP and 15 mm in front of the axis. Draw its top view, sectional front view.
(b) A pentagonal pyramid of base side 30 mm and axis length 50 mm lies on one of its triangular faces on HP and with its axis parallel to VP. It is cut by a horizontal section plane whose VT passes through the centre of the base on the pyramid. Draw the sectional plan.

Contd. in Page 2

- 6 Two views of a casting are shown below. Draw the isometric view of the casting (dimensions are in mm)



- 7 A square hole of 35 mm side is cut in a cylindrical shaft of 60 mm diameter and 100 mm long. The axis of the hole intersects that of the shaft at right angles. All the faces of the hole are inclined at 45° to HP. Draw the projections of the shaft when an imaginary plane containing the two axes is parallel to VP.
- 8 A man stands at a distance of 5 m from a flight of four stone steps having a width of 2 m, tread 0.3 m and rise 0.2 m. The flight makes an angle of 30° with the picture plane and touches the same at a distance of 2 m to the right of the center of vision. Take horizon level to be 1.5 m above the ground level. Draw the perspective projection of the flight.

ENGINEERING DRAWING

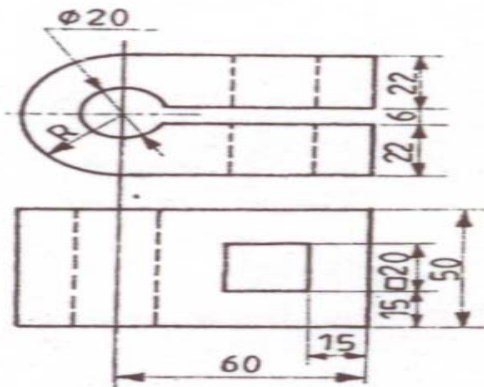
(Common to EIE, IT & ME)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Draw the involute of a circle 40 mm diameter. Draw a tangent and normal to the curve at a point 95 mm from the center of the circle.
- (b) Draw the involute of a regular hexagon of side 25. Draw a tangent and normal to the curve at a distance of 100 from the center of the hexagon.
- 2 A line PQ 40 mm long is parallel to VP and perpendicular to HP. One end Q is 15 mm above HP. Another end P is 55 mm above HP and 25 mm in front of VP. Draw the projections.
- 3 An equilateral triangle of 50 side, has its plane parallel to H.P and 30 away from it. Draw the projections when one of its sides is (i) perpendicular to V.P (ii) parallel to VP (iii) inclined to VP at angle of 45° .
- 4 (a) A triangular prism, 40 mm of base and 60 mm of length of axis, has its axis perpendicular to VP. Draw the projections if one of the rectangular faces parallel to the HP.
- (b) A triangular prism, 40 mm of base and 60 mm of length of axis, has its axis perpendicular to VP. Draw the projections if one of the rectangular face 45° to the HP.
- 5 A cone, base 75 mm diameter and axis 75 mm long, has its axis parallel to the V.P. and inclined at 45° to the H.P. A horizontal section plane cuts the cone through the mid-point of the axis. Draw the front view, sectional top view and an auxiliary top view on a plane parallel to the axis.
- 6 Two views of a casting are shown below. Draw the isometric projection of the casting (dimensions are in mm)



- 7 A triangular prism, having base with a 80 mm side and 100 mm long axis, is resting on its base on the H.P. with a side of the base parallel to the V.P. it is penetrated by another triangular prism having base with a 40 mm side and a 100 mm long axis having a face parallel to the H.P. The axes of the prisms bisect each other at right angles. Draw the projections of the combination and show the lines of intersection.
- 8 Draw a perspective view with a square plane with a 50 mm side which stands vertically on the GP with an edge parallel to and 10 mm behind the PP. The surface of the plane is inclined at 30° to PP. The station point is 60 mm in front of PP, 65 mm above GP and lies in a CP which is 55 mm towards right of the centre of the plane.

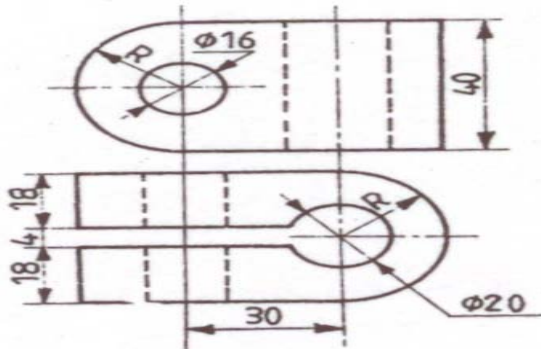
B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012
ENGINEERING DRAWING
 (Common to EIE, IT & ME)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
 All questions carry equal marks

- 1 (a) A circle of 40 diameter rolls along a line for one revolution clockwise. Draw a locus of a point on the circle, which is in contact with the line. Also draw a tangent and a normal to the curve at a point 35 from the directing line.
 (b) Draw an involute of a circle of 30 mm diameter for one complete revolution.
- 2 (a) A point M is 35 mm above HP and 40 mm in front of VP. Draw its projections.
 (b) A point B is 45 mm above HP and 60 mm behind VP. Draw the projections.
 (c) Draw the projections of a point B lying on HP and 55 mm in front of VP.
 (d) A point M is 60 mm below HP and 45 mm in front of VP. draw the projections
- 3 Draw the projections of regular pentagon of 25 mm side having its surface inclined at 30° to H.P and side parallel to H.P. and inclined at an angle of 60° to V.P.
- 4 (a) A square prism, 40 mm of base and 60 mm of length of axis, has its axis perpendicular to HP and one of the rectangular faces parallel to the VP. Draw the projection if the base is 10 mm above the HP.
 (b) A square prism, 40 mm of base and 60 mm of length of axis, has its axis perpendicular to HP and one of the rectangular face 60° to the VP. Draw the projection if the base is 10 mm above the HP.
- 5 A hexagonal pyramid, base 50 mm side and axis 100 mm long, is lying on the H.P. on one of its triangular faces with the axis parallel to the V.P. A vertical section plane the H.T. of which makes an angle of 30° with the reference line passes through the centre of the base and cuts the pyramid, the apex being retained. Draw the top view, sectional front view, true shape of the section and the development of the surface of the cut-pyramid.
- 6 Two views of a casting are shown below. Draw the isometric view of the casting (dimensions are in mm).



- 7 A square prism, having base with a 60 mm side and a 100 mm long axis is resting on its base on the H.P. with the faces equally inclined to the V.P. It is penetrated by another square prism of the same dimensions having its axis parallel to both the reference planes and 15 mm away from the axis of the first prism. Draw the projections of the combination and show lines of intersection when the faces of the penetrating prism are equally inclined to the H.P.
- 8 A square pyramid of side of base 30 mm and axis 40 mm long rests with its base on the ground plane such that one of its base sides is parallel to the picture plane and 10 mm in front of it. The station point is 50 mm in front of the picture plane, 25 mm to the left of the axis of the pyramid and 55 mm above the ground. Draw the perspective projection.

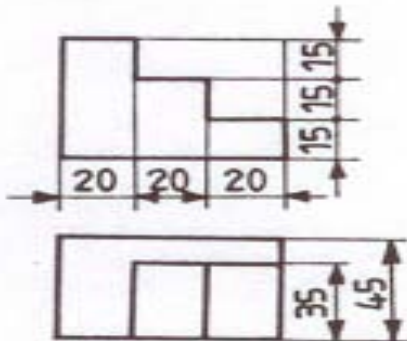
ENGINEERING DRAWING
(Common to EIE, IT & ME)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) Draw the involute of an equilateral triangular of side 20 mm.
(b) A tread of length 165 mm is wound round a circle of 40 mm diameter. Trace the path of end point of the tread.
- 2 An Ornamental light O is placed 10 m above the floor and in the center of an auditorium 40 m * 50 m* 35 m high. Determine graphically its distance from one of the corners between the roof and two adjacent walls.
- 3 (a) A rectangular lamina of sides 30 mm X 40 mm is perpendicular to HP and inclined at 30° to VP. Draw its projections.
(b) A square lamina ABCD of side 40 mm is perpendicular to HP and parallel to VP. Draw its projections.
- 4 A pentagonal pyramid of edge of base 30 mm and length of axis 65 mm is resting on a corner of the base on the HP. The triangular face opposite to the corner on the HP is inclined to the HP at 45° with its shorter edge inclined to the VP at 60° . draw its projections
- 5 A cube of 50 mm long edges is resting on the H.P. with a vertical face inclined at 30° to the V.P. It is cut by a section plane, perpendicular to the V.P. inclined at 30° to the H.P. and passing through a point on the axis, 38 mm above the H.P. Draw the sectional top view, true shape of the section and development of the surface of the remaining portion of the cube.
- 6 Two views of a model are shown below. Draw the isometric projection of the model (dimensions are in mm).



- 7 A square prism, having base with a 50 mm side and a 90 mm long axis, rests on its base on the ground with a face inclined at 30° to the V.P. It is penetrated by a horizontal cylinder with a 40 mm diameter. Their axes bisect each other at right angles. Draw three views of the combination and show the curves of intersection.
- 8 A pentagonal plane with a 30 mm side lies on the GP with an edge parallel to and 20 mm behind the PP. The station point is 50 mm in front of PP, 65 mm above GP and lies in a CP which is at a distance of 40 mm towards right of the centre of the object. Draw its perspective view.

B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012

ENGINEERING DRAWING

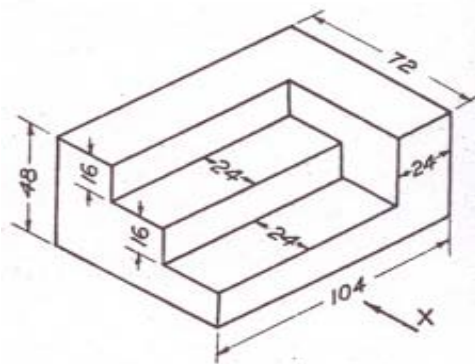
(Common to EIE, IT & ME)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 A circle of 60 mm diameter rolls without slipping on the outside of another circle of diameter 150 mm. Show the path of a point on the periphery of the (generating)rolling circle, diametrically opposite to the initial point of contact between the circle
- 2 (a) Draw the projections of a point A lying on HP and 50 mm in front of VP.
(b) Draw the projections of a point A lying on VP and 55 mm above HP.
(c) A point D is 35 mm below HP and 35 mm behind VP. Draw the projections.
(d) A point S is 35mm above HP and 55mm behind VP. Draw the projections.
- 3 (a) A pentagonal plate of 35 mm side is perpendicular to V.P and parallel to H.P One of its edges is perpendicular to V.P. Draw its projections.
(b) A square lamina of side 40 mm is perpendicular to VP and parallels to HP. Draw its projections.
- 4 (a) Draw the projections of a cube of 30 mm edge ,resting in the H.P .on one of its corners with a solid diagonal parallel to both H.P and V.P.
(b) A cone of base 50 mm diameter and axis 65 mm long, lies with one of its generators on H.P and its axis parallel to V.P Draw its projections.
- 5 (a) A hexagonal prism of side of side of base 25 mm axis 60 long is freely suspended from a corner of the base. Draw the projections.
(b) A square pyramid of base 35 mm side and axis 50 mm long is resting on one of its triangular faces on HP, with the edges of the base containing that faces inclined at 45° to VP. Draw the projections of the pyramid. Follow the auxiliary plane method.
- 6 Draw the elevation, plan and left and right views of the step model shown in the picture below (dimensions in mm).



- 7 A cylinder resting on its base on the H.P. is penetrated by another cylinder with their axes bisecting at right angles. Draw the projections of the combination and show the curves of intersection. Consider vertical cylinder having a 60 mm base diameter while the penetrating cylinder has a 50 mm diameter.
- 8 A pentagonal plane with a 30 mm side stands vertically on the GP on an edge and a corner touching the PP. The surface of the plane makes an angle of 30° with the PP. The station point is 60 mm in front of PP, 75 mm above GP and lies in a CP which is at a distance of 40 mm towards right of the centre of the plane. Draw its perspective view.

Code: 9A05101

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B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012

PROGRAMMING IN C AND DATA STRUCTURES

(Common to all Branches)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 What is a flow chart? Explain different symbols used for flow chart.
- 2 (a) What are the shift operators? Write a program to shift the entered number by three bits left and display the result.
(b) Write a program to test a given number is prime number or not.
- 3 Write a short notes on the following storage classes:
(a) Automatic.
(b) Static.
(c) Register.
(d) External.
- 4 (a) What is pointer? List out the reasons for using pointers.
(b) How to use pointers as arguments in a function? Explain through an example.
- 5 Write a program in C that defines a structure student to contain name, HTNO, branch of study and define the nested structure marks with member subject1, subject2, subject3 and total. Define three functions where one function sums the marks in subject1, subject2 and subject 3 and places the sum in the total. The second function is used to display the details of the students with marks. The third function is used to display the details according to the ascending order of marks.
- 6 Write a program in C that reverses the contents of a file and copies it into a new file.
- 7 (a) Distinguish between stack and queue.
(b) Explain the representations of stack and queue.
(c) What is header? Explain its role in linked list.
- 8 (a) Define sorting.
(b) What is the difference between internal and external sorting methods?
(c) Give examples for internal and external sorting methods.

Code: 9A05101

2

B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012

PROGRAMMING IN C AND DATA STRUCTURES

(Common to all Branches)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) What is operating system? What are the responsibilities of an operating system?
(b) Distinguish between high level language program and assembly language program.
- 2 (a) What is difference between break and continue statements? Explain with examples.
(b) Write a program to find-out the average of the even numbers by using continue statement.
- 3 (a) Explain about call by reference with an example.
(b) What is recursion? What are the advantages and disadvantages of recursion?
- 4 (a) Explain the process of declaring and initializing pointers. Give examples.
(b) Write a C program to illustrate the use of indirection operator '*' to access the value pointed by a pointer.
- 5 (a) Define structure and give the general syntax for structure.
(b) How to copy and compare structure variables? Illustrate with example.
(c) Give the differences between structures and arrays.
- 6 (a) Write a program in C that reads the name of a file and displays the contents of the file on the user screen.
(b) Write a program in C that reads the contents of a file containing integers and displays the largest among the integers on the user screen.
- 7 Discuss insertion and deletion operation in a queue using arrays.
- 8 (a) Write a C program using functions to perform linear searching.
(b) Write a C program using functions to perform binary searching.

B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012
PROGRAMMING IN C AND DATA STRUCTURES

(Common to all Branches)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 Write short note on the following:
 - (a) Assembler.
 - (b) Interpreter.
 - (c) Compiler.
 - (d) Linker.

- 2
 - (a) Write a brief description about control statements in C.
 - (b) Write a program to reverse a number using for statement.

- 3
 - (a) Write a program to find the product of all the elements in an array.
 - (b) How is a multidimensional array declared and initialized?

- 4
 - (a) Explain the concept of pointer to functions with examples.
 - (b) Write a program to find sum of two matrices using pointers.

- 5
 - (a) Why we need structure in C? Explain.
 - (b) How to declare and initialize a structure with examples?

- 6
 - (a) Write a program in C that converts the contents of a file in to capital letters.
 - (b) Write a C program that sorts the contents of a file containing a list of students' names.

- 7 Write a program to evaluate postfix expression.

- 8
 - (a) Write a program that checks for the occurrence of a given element in the array. Display messages if the number is not found in the list.
 - (b) Write a program in C to sort the given list of student's names in alphabetical order.

B. Tech I Year (R09) Regular & Supplementary Examinations, May 2012
PROGRAMMING IN C AND DATA STRUCTURES
(Common to all Branches)

Time: 3 hours

Max Marks: 70

Answer any FIVE questions
All questions carry equal marks

- 1 (a) What is main memory? Explain two types of main memory.
(b) What is an input device? Mention at least five input devices.
- 2 (a) What is a loop? Why it is necessary in the program? What happens if you create a loop that never ends?
(b) Write a program that reads a positive integer and print its equivalent binary number.
- 3 (a) Distinguish between call by value and call by reference.
(b) Write a program to find the sum of all elements in an array.
- 4 (a) Explain declaration and initialization of arrays of strings.
(b) Write a C program to find whether a given string is palindrome or not.
- 5 Write a program in C that creates an enumerated data type for 7 days of the week. Initialize the first day with 1. Get a day number from the user and display its corresponding day in words.
- 6 Explain in detail the low-level file handling functions. Give example for each.
- 7 Discuss with example the following with respect to singly linked list
(a) Inserting an element as the first element in the list.
(b) Inserting an element as the last element in the list.
(c) Inserting an element at the specified position in the list.
- 8 (a) Discuss binary search algorithmic technique with an example.
(b) Write a program in C to perform linear searching method.
