B.Tech. I Year Supplementary Examinations June 2016

English

(Common to All Branches)

Max. Marks: 70   **Time: 03 Hours**

Answer *any five* questions

All Questions carry equal marks (14 Marks each)

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1. a) How did Pico Iyer's observations match descriptions that he had read of the people live in Ladakh?

   b) Trace out the various services rendered by Visvesvarayya as a Diwan of Mysore?

2. a) Bring out the early life of Mother Teresa?

   b) Explain the work done by C.V. Raman at IACS?

3. a) Did Miss Krishna make a good guest? Give reasons for your answer?

   b) Give an account of the life of Vikram Sarabhai as a scientist?

4. a) What was the work done by the medical teams formed as part of the disaster management efforts in Cuddalore?

   b) Describe the accomplishments of Sam Pitroda?

5. a) Bring out the main theme of the short story "Bubbling well Road"?

   b) How did Anand become a chess champion? What are the distinctions achieved by Anand?

6. a) How does Ray describe the films that are commonly made in India?

   b) Describe Charlie Chaplin's distinguished qualities as a comedian?

7. a) Prepare a report as a Asst. Medical Officer, RIMS, Kadapa. Give an account of the fast spreading Dengue fever in various places of the district and suggest various measures to control the disease. Submit the report to the District Medical and Health Officer, Kadapa

   b) Describe in a paragraph, how people can learn through observing Nature?

8. a) Rewrite the sentences as directed:
   i) It is *mandatory* to write all the questions
                                   (Write the *Synonym* of the underlined word)
   ii) He is regular to college. (Write the *Antonym* of the underlined word)
   iii) This sentence *is not having a definite meaning*.
                                    (Use a one word substitute for the part underlined)
   iv) He is _____ . (raiding/ riding) the bike (Choose the right word)
   v) Shyam is as angry as a ___ (Use appropriate simile to complete the sentence)

   b) Correct the following sentence:
   i) He shall go to a movie.
   ii) Her father's pet dog is not doing well, isn't it?
   iii) Children look me
   iv) Praveen read letter.
   v) Open up in page sixteen.

   c) Use the Idioms given to frame your own sentences
      i) The Pros and Cons
      ii) The hat trick

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Code : 1GC12

R-11/R-13

B.Tech. I Year Supplementary Examinations June 2016
Engineering Physics
(Common to All Branches)

Max. Marks: 70   **Time: 03 Hours**

Answer *any five* questions
All Questions carry equal marks (14 Marks each)
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1.	a)	Explain Polarization of light wave.	3M
	b)	Describe the Fraunhofer diffraction due to single slit.	8M
	c)	Find the thickness of half wave plate for a light beam of wavelength 600nm, if the difference in the refractive indices of E and O rays is 0.1624.	3M
2.	a)	State and explain Bragg's Law for X-ray diffraction.	3M
	b)	Describe crystal structure determination by powder method.	8M
	c)	X-rays of wavelength 0.1 nm was diffracted by an angle of 30° for the second order diffraction. Find the inter planar distance of the cubic crystal	3M
3.	a)	Mention the postulates of classical free electron theory.	3M
	b)	Describe the behavior of a free particle in a one dimensional potential box.	8M
	c)	Calculate the wavelength associated with electron raised to a potential of 1200V	3M
4.	a)	Explain diffusion of charge carriers in a semiconductor.	3M
	b)	Explain the formation of p-n junction in a semiconductor with necessary theory	7M
	c)	Distinguish between direct and indirect band gap semiconductors.	4M
5.	a)	Explain electronic polarization in a dielectric.	4M
	b)	Discuss the origin of magnetic moments in magnetic materials.	6M
	c)	What are soft and hard magnetic materials.	4M
6.	a)	Describe the flux quantization in superconductor.	4M
	b)	Explain the construction and working of Ga-As laser with neat diagram.	6M
	c)	Mention the characteristics of laser.	4M
7.	a)	Describe the construction of hologram.	4M
	b)	Describe briefly the different types of optical fibers with neat diagram with refractive index profiles.	7M
	c)	An optical fiber has a core refractive index of 1.52 and cladding refractive index of 1.50. Find its numerical aperture.	3M
8.	a)	What are nanomaterials and mention their significance.	4M
	b)	Describe Sol – Gel method of synthesis of nanomaterials.	6M
	c)	Mention the properties of carbon nanotubes.	4M

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Code : 1GC13

R-11/R-13

B.Tech. I Year Supplementary Examinations June 2016
Engineering Chemistry
(Common to All Branches)

Max. Marks: 70   **Time: 03 Hours**

Answer *any five* questions
All Questions carry equal marks (14 Marks each)
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1. a) Write about methods for the treatment of potable water.   6M
    b) What is external treatment of water? Write about ion-exchange method for treatment of industrial water.   5M
    c) What is caustic embrittlement and how to prevent it?   3M

2. a) Explain the applications of conductometric titrations in detail.   5M
    b) Explain H_2-O_2 fuel cell with neat sketch and chemical reactions.   5M
    c) Ni-Cd battery is recyclable justify!   4M

3. a) Explain the factors which effect the corrosion.   5M
    b) Explain the following methods for preventing corrosion.
        i)   Electroplating   ii) Electro less plating   5M
    c) Write a note on electrochemical corrosion with example.   4M

4. a) What are polymers? Write the mechanism for addition polymerization of ethylene.   6M
    b) Write the differences between thermosetting and thermoplastic resins.   5M
    c) Write a note on elastomers.   3M

5. a) Write a note on the following.
        i)   RDX ii)   Nitroglycerin   8
    b) Explain the classification and properties of lubricants in detail.   6M

6. a) Define independent and dependent variables with suitable examples   6M
    b) Explain one component system for water in detail.   8

7. a) What is fuel? Write the classification of fuel.   3M
    b) 0.6 g of coal sample with 92% C, 5% Hydrogen, and 3% ash, caused a rise in the temperature of 2000 g water by 3.2^o C in a bomb calorimeter experiment. Calculate the gross and net calorific value of coal, given.   6M
    c) Explain the conversion of coal into coke with neat sketch.   5M

8. a) Define refractory? Write the classification of refractory with suitable examples.   6M
    b) Explain the composition of Portland cement.   4M
    c) Comment on Portland cement analysis.   4M

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B.Tech. I Year Supplementary Examinations May/June 2016
# Engineering Mechanics
(Common to CE and ME)

**Max. Marks: 70**   **Time: 03 Hours**

Answer *any five* questions
All Questions carry equal marks (14 Marks each)
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1. a) State Varignon's theorem. Distinguish between moment of a force and moment of a couple.   4M

   b) Three identical rollers shown in fig1 have weights W each. Determine the least value of angle   which will prevent the arrangement from collapse. Neglect friction.
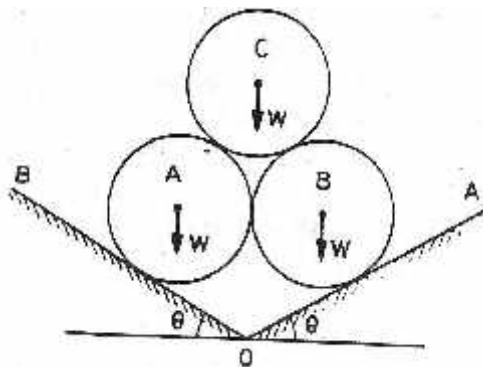

            10M

2. a) Define polygon law of forces   2M

   b) A vertical pole is connected by three cables PA, PB and PC tied at a common point P 8 meters above ground. The base points of cables are A(4,0,0), B(-1,4,0) and C(-2,-3,0) meters. If the tension in PA is 20KN, calculate the tensions in PB and PC so that the resultant force exerted on the pole is vertical. Find the force exerted on the pole.   12M

3. a) What are the assumptions made in the analysis of trusses   2M

   b) Calculate the axial forces in all the members of the truss shown in fig2.
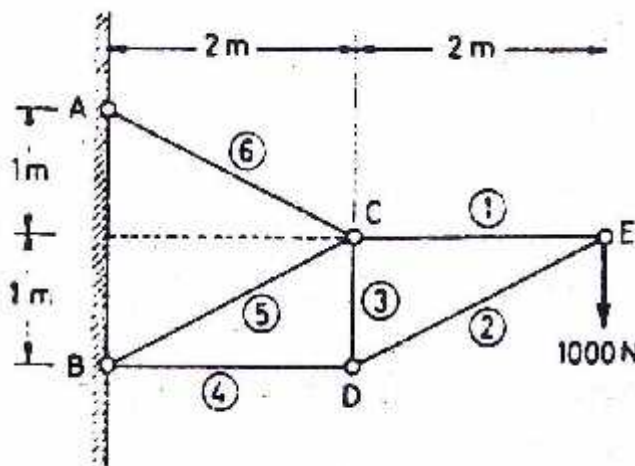
            12M

4. a) Define static, dynamic and rolling friction. Briefly explain cone of friction. 4M

   b) A block of weight 1000N is to be raised against a surface inclined at 60 degrees to horizontal by means of a 15 degree wedge as shown in fig 3. Find the horizontal force P which will just start the block to move if the coefficient of friction at all contact surfaces is 0.2. Assume wedge to have negligible weight.

   10M
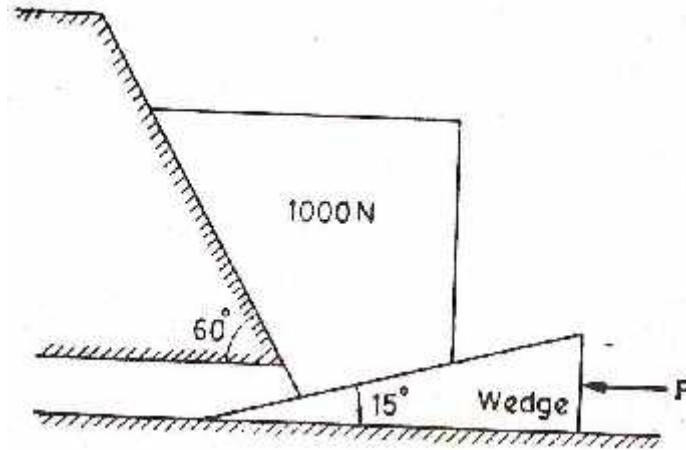
5. a) State the two theorems of Pappus 4M

   b) A body is made of a hemisphere of radius r and a cone of base radius r and height h. The hemispherical surface of the body rests on horizontal surface. What should be the greatest height of the cone such that the combination of cone and hemisphere will stand upright? 10M

6. a) State parallel axis theorem 2M

   b) Derive the expressions for mass moment of inertia of a cylinder of radius r and height h about axes passing through its base. 12M

7. a) Briefly explain tangential and normal components of acceleration with reference to curvilinear motion. 4M

   b) The motion of a particle is described by $x=(2)(t+1)^2$ and $(2)(t+1)^{-2}$. Show that the path travelled by the particle is a rectangular hyperbola. Find the velocity and acceleration of the particle at time t=0. 10M

8. a) State the principle of conservation of energy 2M

   b) A train weighing 2300 KN moves up an inclination of 1 in 100. The train starts from rest and moves with a constant acceleration against a frictional resistance of 10N per KN of weight of the train. It attains a maximum speed of 30 Kms/hr in a distance of 1Km. Find (**i**) Maximum power required by the train (**ii**) Power required to maintain the speed of 30 Kms/hr. 12M

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Code : 1GC14

B.Tech. I Year Supplementary Examinations May/June 2016
Mathematics-I
(Common to All Branches)

Max. Marks: 70   **Time: 03 Hours**

Answer *any five* questions
All Questions carry equal marks (14 Marks each)
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1. a) Solve $\dfrac{dy}{dx} + x\sin 2y = x^3 \cos^2 y$.   7M

    b) A body is heated to $110°C$ and placed in air at $10°$ C. After 1 hour its temperature is $60°$ C. How much additional time is required for it to cool to $30°$C?   7M

2. a) Solve $\left(D^2 + 2\right)y = x^2 + x^3 + e^{-2x} + \cos 3x$, *where* $D = \dfrac{d}{dx}$.   7M

    b) Solve Non-Homogeneous ODE by Method of variation of parameters

    $(D^2 - 2D + 2)y = e^x \tan x$, *where* $D = \dfrac{d}{dx}$.   7M

3. a) Verify Rolle's theorem for $f(x) = e^x (\sin x - \cos x)$ *in* $\left[\dfrac{f}{4}, \dfrac{5f}{4}\right]$.   7M

    b) Find the maximum and minimum values   of
    $f(x, y) = x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$.   7M

4. a) Trace the curve $r^2 = a^2 \sin 2_{\textit{n}}$.   7M

    b) Find the perimeter of the loop of the curve $3ay^2 = x(x - a)^2$.   7M

5. a) Evaluate $\displaystyle\int_{-1}^{1} \int_{0}^{z} \int_{x-z}^{x+z} (x + y + z)\,dx\,dy\,dz$.   7M

    b) Evaluate $\displaystyle\int_{0}^{\infty} \int_{0}^{\infty} e^{-(x^2+y^2)}\,dx\,dy$ by changing to polar coordinates.   7M

6. a) (i) Find the Laplace Transform of $\left\{\left(\sqrt{t} + \dfrac{1}{\sqrt{t}}\right)^3\right\}$.

    (ii) Find $L^{-1}\left\{\dfrac{2s^2 - 6s + 5}{s^3 - 6s^2 + 11s - 6}\right\}$.   8M

    b) Find the Laplace Transform of   a piecewise periodic function $f(t)$ with period T .   6M

7. a) (i) Find the Laplace Transform of   the second derivative of $f(t)$.

    (ii) Find $L\left\{\displaystyle\int_{0}^{t} u\, e^{-u} \sin 4u\, du\right\}$.   7M

    b) Solve the following differential equation by the transform method;

    $\left(D^2 + n^2\right)x = a \sin (nt + \ulcorner)$, $x = D\,x = 0$ *at* $t = 0$ *where* $D = \dfrac{d}{dt}$.   7M

8. a) Evaluate divergence of $\left(2x^2 z\, i - xy^2 z\, j + 3yz^2\, k\right)$ at the point $(1, 1,\ 1)$.   4M

    b) State Green's theorem and Verify Green's theorem in plane for
    $\displaystyle\int_{C}\left[\left(3x^2 - 8y^2\right)dx + \left(4y - 6xy\right)dy\right]$, Where C is boundary of the region defined

    by $y = \sqrt{x}$ *and* $y = x^2$.   10M

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B.Tech. I Year Supplementary Examinations May/June 2016
C Programming and introduction to Data Structures
(Common to Civil, EEE, ME and ECE)

Max. Marks: 70   **Time: 03 Hours**

Answer *any five* questions
All Questions carry equal marks (14 Marks each)
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1.	a)	What are computing environments?	7M
	b)	Explain the history of programming languages.	7M
2.	a)	Write a C program for checking the given number is prime or not	7M
	b)	Explain with example, switch statement in C.	7M
3.	a)	How single dimensional arrays and multidimensional arrays are declared and initialized? Explain with suitable examples.	7M
	b)	How pointers permit inter function communication.	7M
4.	a)	How to declare and initialization of strings? Explain them with examples.	8M
	b)	How C permits allocation and reallocation of memory.	6M
5.	a)	Write a C program using structure to create a library catalogue with the following fields; Access number, author's name. Title of the book, year of publication, publisher's name, price	6M
	b)	Differentiate between a structure and union with respective allocation of memory by the compiler. Given an example of each.	8M
6.	a)	Write a program to copy upto 100 characters from a file to an output array.	7M
	b)	Distinguish between text mode and binary mode operation of a file.	7M
7.	a)	What is liked list? List different types of linked list. Write a C program to demonstrate simple linked list.	9M
	b)	Describe the operations on a stack with examples.	5M
8.	a)	Write a C program to search for a given element in the integer array using binary search	8M
	b)	Compare the advantage and disadvantage of bubble, insertion and selection sort	6M

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Code : 1G512

B.Tech. I Year Supplementary Examinations May/June 2016
Engineering Graphics
(common to CE & ME)

Max. Marks: 70   **Time: 03 Hours**

Answer *any five* questions
All Questions carry equal marks (14 Marks each)
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1. a) 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 10mm distance from each line.   7M

   b) A circle of 50 mm diameter rolls along a straight line without slipping. Draw the curve traced out by a point P on the circumference, for one completer revolution of the circle. Name the curve and draw a tangent on it 40 mm from the line.   7M

2. A line PQ inclined at 45° to the VP, has a 60 mm long front view. The end P is 10 mm from both principal planes while the end Q is 45 mm above the HP. Draw the projections of the line and determine its true length and inclinations with the principal planes. Also locate its traces.   14M

3. A Thin rectangular plate of sides 60 mm X 30 mm has its shorter side in the VP and inclined at 30 ° to the HP. Project its top view if its front view is a square of 30 mm long sides.   14M

4. A cone of base diameter 50 mm and axis 60 mm long is resting on its base on the HP on one of its generators with axis parallel to the VP.   14M

5. A cylinder with a 50mm base diameter and 70 mm long axis is resting on ground with its axis vertical. A section plane inclined at 45° to HP cuts the cylinder such that plane passes through the top of the generators and cuts all the remaining generators. Draw the development of its lateral surfaces.   14M

6. Draw the orthographic views of the given object.
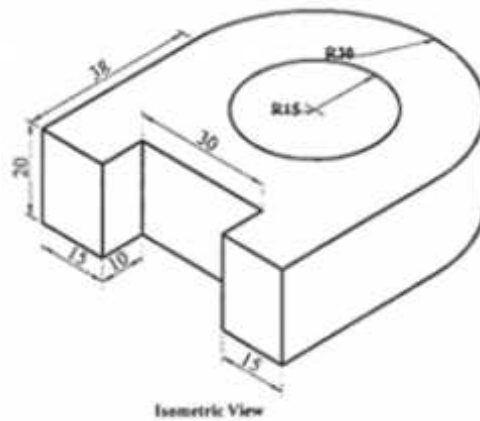
Isometric View

14M

7. A hexagonal prism of side of base 30 mm is resting on one of its bases on HP with a face parallel to the VP. The Prism contains a square hole of 20mm side. The axis of the hole is parallel to the VP and inclined at an angle 30 ° to the HP intersecting the axis of the prism. The faces of the hole are equally inclined to the VP. Draw the lines of intersection.   14M

8 A square prism of base0 mm and axis 60 mm long lies on its base in the GP with a face parallel to and 15 mm behind the PP. The station point is lies in the CP which is 50 mm towards the right of the axis, 65 mm in front of the PP and 80 mm above the GP. Draw its perspective view.   14M

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