

Hall Ticket Number :										
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R-11/R-13

Code : 1G113

B.Tech. I Year Supplementary Examinations May 2017
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)

1. a) Define algorithm. Write an algorithm to find product of two integers using repetitive addition.
b) List and explain the various symbols used in flowchart with figures.
2. a) There are four coins a, b, c, d out of which three coins are of equal weight and one coin is heavier. Write a C program to find the heavier coin.
b) Write about while and for loops and write suitable examples.
3. a) What is an array? What are advantages of arrays over ordinary variables? How arrays are declared and initialized?
b) Write a program for finding the largest number in an array.
4. a) Write a program to count the number of digits, alphabets, white spaces and other characters in a sentence.
b) Give a detailed note on pointers.
5. a) Define structure and give the general syntax for structure. Write suitable example program.
b) Compare structures and unions.
6. Describe various types of files and operations on files with an example.
7. What are the advantages and disadvantages of stack? Write a program to illustrate stack operations.
8. a) Write binary search program in c for finding given element is in the list or not.
b) Write a c program to sort given list using selection sort.

Code: 1G513

B.Tech. I Year Supplementary Examinations May 2017

Engineering Drawing

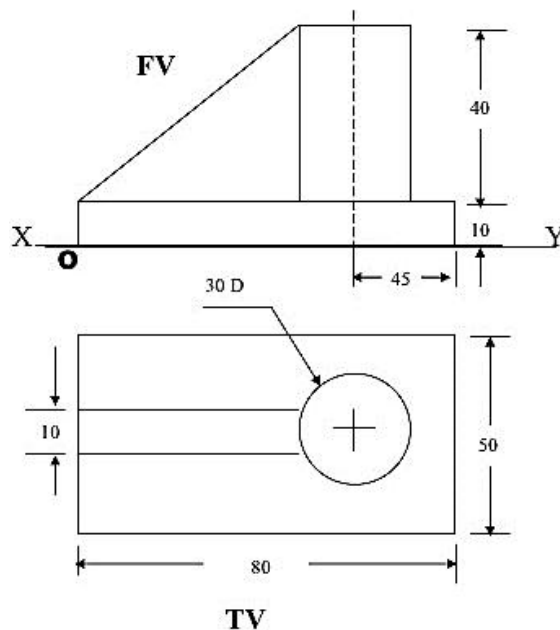
(Common to EEE, ECE, CSE & IT)

Max. Marks: 70

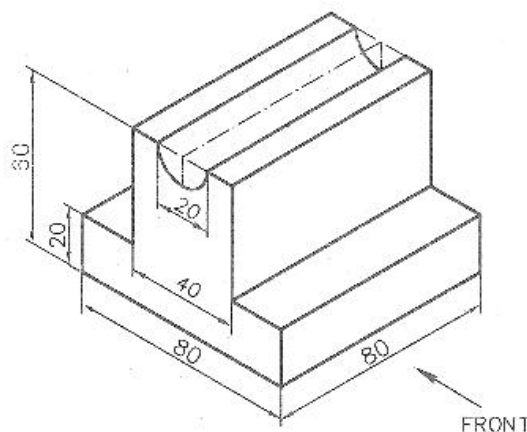
Time: 3 Hours

Answer any **five** questionsAll Questions carry equal marks (**14 Marks** each)

- Construct a parabola; with the distance between the focus and the directrix as 50mm. Draw the tangent to the curve at a point 20 mm from the axis.
- Draw a hypocycloid of a circle of 40 mm diameter which rolls inside another circle of 200 mm diameter for one revolution. Draw a tangent and normal at any point on it.
- The end P of a line PQ, 70 mm long is 15 mm above HP and 20 mm in front of VP. Q is 40 mm above HP. Its top view is inclined at 45° to the VP. Draw the projections of the line and find its true inclinations with the VP and HP.
- A square lamina PQRS of side 40 mm rests on the ground on its corner P in such a way that the diagonal PR is inclined at 45° to HP and apparently inclined to the VP. Draw its projections.
- Draw the projections of a pentagonal prism of base side 25 mm and axis 50 mm rests on H.P on one of its base edges with its axis inclined at 60° to the HP and parallel to the VP.
- A cylinder, with diameter of base 60 mm and axis 70 mm long, is resting on its base on HP. A section plane, perpendicular to VP and inclined at 45° to HP passes through the axis at a distance of 20mm from its top end. Draw the isometric projection of the truncated cylinder
- Draw the isometric view of the object from the given orthographic projections



- Sketch the front view and top view of the object given in the figure below.



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Code : 1G311

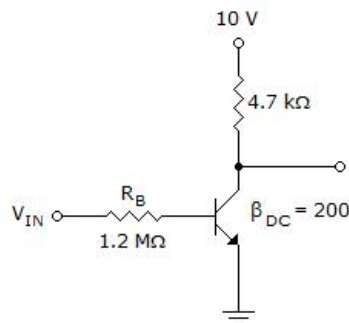
B.Tech. I Year Supplementary Examinations May 2017

Electronic Devices and Circuits

(Common to EEE & ECE)

Max. Marks: 70**Time: 03 Hours**Answer any **five** questionsAll Questions carry equal marks (**14 Marks** each)

1. a) Distinguish between conductor, semiconductor and insulator. 4M
- b) Show that the Fermi level lies at the center of the forbidden energy gap in an intrinsic semiconductor. 6M
- c) Define Hall effect and give its applications. 4M
2. a) Sketch the v-I characteristics of pn-junction diode and write the diode equation. Discuss the temperature dependence of the characteristics. 8M
- b) Define break down. Discuss the significance of break down in zener diode. 6M
3. a) Draw the circuit diagram of bridge rectifier and explain the operations with necessary waveforms. 7M
- b) Determine the ripple factor of a capacitor filter when it is connected in the output of a center-tapped full wave rectifier. 7M
4. a) Explain how the transistor acts as an amplifier. 7M
- b) Compare the CE, CB and CC configurations of bipolar junction transistor. 4M
- c) For the figure given, if $V_{CE} = 0.2 \text{ V}$, find the value of $I_{C(sat)}$.



5. a) Define and discuss the significance of stability factor and derive the general expression of stability factor. 7M
- b) Write short notes on thermal stability and thermal runaway. 7M
6. a) What the advantages and disadvantages of FET over BJT? Explain the operation of JFET with necessary diagrams. 7M
- b) Explain the construction and operation of enhancement mode MOSFET with necessary diagrams and mention its applications. 7M
7. a) State and prove the Miller's theorem. 6M
- b) For a CB transistor amplifier driven by a voltage source of internal resistance $R_s = 1.2 \text{ k}$ the load impedance is $R_L = 1 \text{ k}$. The h-parameters are $h_{ib} = 22$, $h_{fb} = -0.98$, $h_{ob} = 0.5 \mu\text{A/V}$, $h_{rb} = 3 \times 10^{-4}$. Calculate A_V , A_I , R_I and R_O . 8M
8. a) Explain the operation of varactor diode with necessary equations and diagrams. Mention its applications. 7M
- b) Draw the construction and two transistor equivalent diagrams of silicon controlled rectifier and explain the operation with its characteristics. 7M

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R-11 / R-13

Code: 1GC13

B.Tech. I Year Supplementary Examinations May 2017

Engineering Chemistry

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

Answer any **Five** questions

All Questions carry equal marks (**14 Marks** each)

1. a) Estimate the amount of hardness present in the water samples by EDTA method? 6M
b) What are scales? How are they formed? Give their disadvantages and prevention methods. 8M
2. a) Explain the chemical reactions involved in the working of a Methanol-Oxygen fuel cell? 7M
b) Discuss the general properties of insulating materials? 7M
3. a) Explain electrochemical theory of corrosion with necessary equations? 8M
b) Write in brief on sacrificial anodic protection method to control corrosion 6M
4. a) Distinguish between thermoplastic and thermosetting resins. 6M
b) Write the preparation, properties and uses of BUNA-S and Silicone rubber 8M
5. a) What are explosives? How are they classified? 7M
b) Discuss the significance of flash & fire point of a good lubricant? 7M
6. a) Explain the terms involved in Phase rule equation? 7M
b) Discuss the application of phase rule to water system? 7M
7. a) What is calorific value of a fuel? How calorific value of a solid fuel is determined using bomb calorimeter? 8M
b) Mention the characteristics of a good fuel. 6M
8. a) Define setting and hardening of cement. Explain the process using chemical reactions involved? 8M
b) What are the reasons for the failure of a refractory? 6M

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R-11 / R-13

Code: 1GC12

B.Tech. I Year Supplementary Examinations May 2017

Engineering Physics
(Common to All branches)

Max. Marks: 70

Time: 3 Hours

Answer any **Five** questions

All Questions carry equal marks (**14 Marks** each)

1. a) Define interference and explain the formation of Newton rings with necessary theory. 8M
b) Give the construction and working of Nicol prism 6M
2. a) What is a Bravais lattice? What are the different space lattices in cubic system? Show that the packing factor of simple cubic is 52%. 8M
b) Describe Laue's method of determining crystal structure. 6M
3. a) Give the salient features of Kronig-Penny model. 7M
b) Show that the energies of a particle in a one dimensional potential box are quantized. 5M
c) Find the lowest energy of an electron confined in a one dimensional potential box of side 0.1nm. ($h=6.62 \times 10^{-34}$ Js and mass of electron = 9.1×10^{-31} kg) 2M
4. a) Obtain Einstein's relation between diffusion coefficient and mobility of charge carriers. 6M
b) Define Hall effect and give its applications. 5M
c) A silicon plate of thickness 1mm, breadth 10mm and length 100mm is placed in a magnetic field of 0.5 wb/m^2 acting perpendicular to its thickness. If 10^{-2} A current flows along its length, calculate the Hall voltage developed if the Hall coefficient is $3.66 \times 10^{-4} \text{ m}^3/\text{coulomb}$. 3M
5. a) Distinguish between Dia, Para and Ferro magnetic materials. 6M
b) Derive the expression for local field by Lorentz method and express Clausius-Mosotti equation 8M
6. a) Explain AC and DC Josephson effects. 6M
b) Give the construction and working of Ruby Laser. 8M
7. a) Derive the expression for numerical aperture of an optical fiber. 7M
b) Estimate the numerical aperture and acceptance angle of a fiber with core index of 1.54 and a cladding index of 1.50 when the fiber is inside water of refractive index 1.33 3M
c) Give some applications of Holography. 4M
8. a) Describe briefly (i) Chemical vapour deposition and (ii) Ball milling techniques used in fabricating nanomaterials. 8M
b) Define Carbon Nanotubes and give any four applications of nanomaterials. 6M

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Code: 1GC14

B.Tech. I Year Supplementary Examinations May 2017

Mathematics-I

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questionsAll Questions carry equal marks (**14 Marks** each)

1. a) Solve $x \frac{dy}{dx} - y = x^2$ 6M
 b) Find the orthogonal trajectories of $r^n = b^n \sin n_\theta$, where b is parameter 8M
2. a) Solve $(D^2 + 25)y = \tan 5x$, using the method of variation of parameters. 9M
 b) Solve $(D^2 + 6D + 9)y = e^{-3x}$ 5M
3. a) Verify Rolle's theorem for $g(x) = 4 + x^{\frac{1}{3}}$ in $[-2, 2]$. 4M
 b) Discuss maxima and minima of $f(x) = \sin x \sin y \sin(x + y)$ 10M
4. a) Find the length of the arc of the parabola $y^2 = 4ax$ cut off by the straight line $y = x$. 7M
 b) Trace the curve $x^3 + y^3 = 3axy$, 'a' is a constant 7M
5. a) Change of order of integration and evaluate $\int_0^{4a} \int_{\frac{x^2}{4a}}^{2\sqrt{xa}} 10 \, dx \, dy$ 7M
 b) Evaluate $\int_1^e \int_1^{\log y} \int_1^{e^x} \frac{\log z}{6} \, dz \, dx \, dy$. 7M
6. a) Find the Laplace transform of a triangular function $f(t) = \begin{cases} t & \text{if } 0 < t < 1 \\ 2-t & \text{if } 1 < t < 2 \end{cases}$ and $f(t+2) = f(t)$ 7M
- b) Using convolution theorem, evaluate $L^{-1} \left[\frac{s^2}{(s^2 + a^2)(s^2 + b^2)} \right]$ 7M
7. Using Laplace transform solve $y''(t) + 3y'(t) + 2y(t) = e^{-t}$, given $y(0) = 0$, $y'(0) = 1$ 14M
8. Verify Green's theorem for $\vec{F} = xy \vec{i} + x^2y^3 \vec{j}$ over a region C, where C is a triangle formed by vertices (0, 0), (1, 0) and (1, 2). 14M
