

Hall Ticket Number :

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**R-11 / R-13**

**Code: 1G311**

B.Tech. I Year Supplementary Examinations May / June 2019

**Electronic Devices and Circuits**

( Common to EEE & ECE )

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

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

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1. a) What do mean by drift current? What is the total current density due to holes and electrons in intrinsic semiconductor?  
b) What are the characteristics of metals, insulators and semiconductors?
2. Describe the reverse bias characteristics of a Zener diode and explain the applications of it
3. What are the different considerations for selection of a filter in rectifiers? Discuss each with necessary sketches.
4. a) What are the basic transistor operating regions present in a configuration? Discuss.  
b) How a transistor can be operated as a switch?
5. a) What are the factors that affect the bias variations?  
b) What is thermal runaway? Discuss the precautions.
6. Draw the experimental setup for obtaining JFET drain characteristics and list out the different regions in the curve.
7. a) What do you mean by dual of miller's theorem? Explain  
b) Describe the h parameters of an ideal CB transistor with necessary diagrams
8. Write a note on
  - (a) Photo diode
  - (b) Diac
  - (c) Triac

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**Code: 1G513**

B.Tech. I Year Supplementary Examinations May 2019

**Engineering Drawing**

( Common to EEE, ECE, CSE and IT )

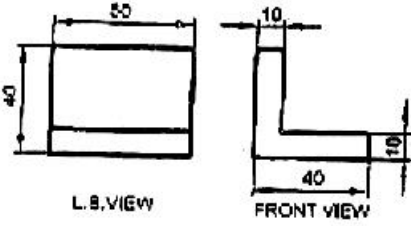
Max. Marks: 70

Time: 3 Hours

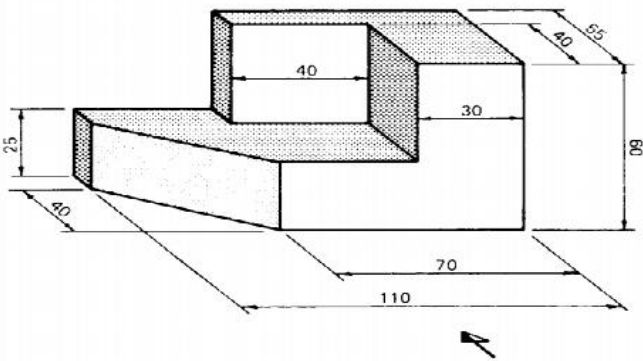
Answer any **five** questions  
All Questions carry equal marks (**14 Marks** each)

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1. Draw a hyperbola when the distance between its focus and directrix is 50mm. Also draw a tangent and a normal at a point 70mm from the directrix.
2. Draw a cycloid for one complete revolution of a circle having a 50mm diameter. Draw a tangent and normal to the curve at a point distant 35mm above the base line.
3. A line AB, 90mm long is inclined at  $30^\circ$  to the HP. Its end A is 12mm above the HP and 20mm in front of the VP. Its front view measures 65mm. Draw the top view of AB and determine its inclination with the VP.
4. Draw the projections of a regular pentagon of 25mm side with its surface making angle of  $45^\circ$  to HP. One of the sides of the pentagon is parallel to HP and 15mm away from it.
5. Draw the projections of a hexagonal prism of base 25mm side and axis 60mm long, when it is resting on one of its corners of the base to HP. The axis of the solid is inclined at  $45^\circ$  to HP
6. Draw an isometric projection of
  - a) A square plane of 40mm
  - b) A rectangular plane of 60mmX80mm
 Both in the horizontal and vertical plane
7. Draw the Isometric View of the following?



8. Draw its Front View, Top View and Side View



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<b>R-11 / R-13</b>
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**Code: 1GC12**

B.Tech. I Year Supplementary Examinations May 2019

**Engineering Physics**

( Common to All Branches )

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

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

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1. a) Define interference and explain conditions of constructive and destructive interference  
b) Describe the theory of Newton's rings experiment
2. Show that FCC closely packed system than others with atoms
3. a) Explain the concept of Fermi-Dirac distribution function  
b) Classify the solids on the basis of energy band theory
4. a) Discuss the bias of pn junction diode in detail  
b) construct how photo diode works
5. a) Define magnetic flux and susceptibility  
b) Distinguish dia, para, ferro, anti ferro and ferrite materials.
6. a) Compare spontaneous and stimulated emissions  
b) Derive condition for stimulated emission through Einstein's coefficients
7. Discuss the structure, refractive index profile and performance characteristics of step index and graded index optical fibers
8. a) Define nanomaterials and write types of nanomaterials  
b) explain basic principles of nanomaterials

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**R-11 / R-13**

**Code: 1GC13**

B.Tech. I Year Supplementary Examinations May/June 2019

**Engineering Chemistry**  
( Common to All Branches )

Max. Marks: 70

Time: 3 Hours

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

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1. a) What are boiler troubles? How are they caused? Give suggestions to minimize the troubles.  
b) What is the principle of EDTA titration? Briefly describe the estimation of hardness of water by EDTA method.
2. a) On what factors does the conductance of a solution depend? How would you proceed to determine the conductivity of a solution?  
b) Differentiate concentration cells with transference and concentration cells without transference
3. Discuss various factors which influence the corrosion of metals?
4. a) Write a note on
  - i. Degree of polymerization.
  - ii. Functionality.
  - iii. Tacticity of polymerb) Write a note on processing of raw rubber? Explain the draw backs of raw rubbers.
5. a) What are explosives? How are they classified?  
b) What are the precautions to be taken during storage of explosives?
6. Explain the salient features of the phase diagram of water system. Discuss why the slope solid-liquid line is negative for water.
7. The percentage composition of a sample of coal by weight was found to be: C = 76%, H = 5.2%, O = 12.8%, N = 2.7%, S = 1.2%, the remaining being ash. Calculate the minimum weight of air necessary for complete combustion of 1 kg of coal and percentage composition by weight of dry products, if 50% excess air supplied.
8. a) What is cement? How do you classify the cement?  
b) What are the reasons for the failure of a refractory?

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<b>R-11 / R-13</b>
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**Code: 1GC14**

B.Tech. I Year Supplementary Examinations May / June 2019

**Mathematics-I**

( Common to All Branches )

Max. Marks: 70

Time: 3 Hours

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

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1. a) Solve  $y(\log y)dx + (x - \log y)dy = 0$ .
- b) If the temperature of the air is  $30^{\circ}\text{C}$ , and the substance cools from  $100^{\circ}\text{C}$  to  $80^{\circ}\text{C}$  in 10 minutes, find the temperature of the substance after 20 minutes.

2. Solve  $\frac{d^2y}{dx^2} - 6\frac{dy}{dx} + 9y = 6e^{3x} + 7e^{-2x} - \log 2$ .

3. a) Verify Rolle's theorem for  $f(x) = (x + 2)^3(x - 3)^4$  in  $(-2,3)$ .
- b) Verify Lagrange's mean value theorem for  $f(x) = \log_e x$  in  $[1, e]$ .

4. a) Trace the curve  $y^2(a - x) = x^2(a + x)$
- b) Trace the polar curve  $r = a(1 - \cos \theta)$

5. Evaluate  $\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} xyz \, dx \, dy \, dz$

6. Find the Laplace transform of  $\frac{\cos at - \cos bt}{t} + t \sin at$

7. Solve  $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = e^x, x = 2, \frac{dy}{dx} = -1$  when  $x = 0$ .

8. a) Find the directional derivative of  $f(x, y, z) = xy^3 + yz^3$  at the point  $(2, -1, 1)$  in the direction of a vector  $\bar{i} + 2\bar{j} + 2\bar{k}$ .
- b) Find  $\text{div } \bar{F}$  and  $\text{Curl } \bar{F}$  at the point  $(1,2,3)$  if  $\bar{F} = 3x^2\bar{i} + 5xy^2\bar{j} + 5xyz^3\bar{k}$ .

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<b>R-11 / R-13</b>
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**Code: 1G112**

B.Tech. I Year Supplementary Examinations May / June 2019

**C Programming and Introduction to Data Structures**

( Common to CE, EEE, ME & ECE )

Max. Marks: 70

Time: 3 Hours

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

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1. a) What is Programming Language? What is the generation of programming Language? Describe it briefly.  
b) What is an algorithm? Describe the characteristics of an Algorithm.
2. a) Describe the Structure of a C program.  
b) Write a C program to calculating area and perimeter of a circle.
3. a) Define an Array? What are different types of Arrays explain?  
b) Write a program to read array of numbers and compute sum and average of the numbers.
4. a) Define string. Explain declaration and initialization of string variables.  
b) What is a pointer? What are the features of pointers? Write a C program to print address of a variable
5. a) Define Structures. Explain with an example how structure members are initialized and accessed.  
b) Explain nested structures with an example?
6. a) Explain different modes to open a file.  
b) Write a C program to copy contents from one file to another file.
7. a) Define Stack. Explain in detail about stack operations.  
b) Write the steps for evaluating postfix expression
8. a) Write a program for sorting given numbers using selection sort technique  
b) Explain linear search with an example.

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