Code: 5G513

I B.Tech. I Semester Supplementary Examinations October 2020

Engineering Drawing-I

(Common to EEE, ECE, CSE & IT)

Max. Marks: 70   Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Construct a pentagon of side length 50mm.
    b) Divide a line of length 70mm into 9 equal parts.

OR

2. a) Inscribe a hexagon in a circle of 60mm diameter
    b) Bisect an angle 45^0

UNIT–II

3. Construct a parabola when the distance from the focus to directrix is 50mm. Also draw a tangent and normal to the curve at a distance of 40mm from the directrix

OR

4. The length of major axis is 120mm and minor axis is 100mm. Draw an ellipse using Arcs of circles method.

UNIT–III

5. A circle of 50mm diameter rolls on a line for one complete revolution clockwise. Draw a normal and tangent to the curve at a distance of 35mm from the directing line. Name the curve.

OR

6. Draw an epi cycloid for a circle of diameter 40mm which rolls on another circle of 120mm diameter clockwise. Also draw a normal and tangent to the curve at distance of 95mm from the center of the directing circle.

UNIT–IV

7. Draw the projections of the following points on the same ground line, keeping the distance between projectors equal to 25 mm.

    (i)Point A, 20 mm above HP, 25 mm behind VP; (ii) Point B, 25 mm below HP, 20 mm behind VP; (iii)Point C, 20 mm below HP, 30 mm in front of VP;

OR

8. A straight line AB of 40 mm length has one of its ends A, at 10 mm from the HP and 15 mm from the VP. Draw the projections of the line if it is parallel to the VP and inclined at 30°to the HP. Assume the line to be located in each of the four quadrants by turns

UNIT–V

9. a) Line AB is 75 mm long and it is 30^0& 40^0 inclined to HP & VP respectively. End A is 12mm above HP and 10 mm in front of VP. Draw projections. Line is in 1st quadrant.

    b) A straight line AB 70mm long has one of its ends 25 mm behind VP and 20 mm below HP. The line is inclined at 30° to HP and 50° to VP. Draw its projections

OR

10. a) A line AB, 50mm long, has its end A in both the H.P. and the V.P. It is inclined at 300 to the H.P. and at 450 to the V.P. Draw its projections

    b) A top view of a 75 mm long line AB measures 65 mm, while the length of its front view is 50 mm. Its I.-lie end A is in the H.P. and 12 mm in front of the V.P. Draw the projections of AB and determine its inclination with H.P. and the V.P.

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R-15

Code: 5GC14

I B.Tech. I Semester Supplementary Examinations October 2020

Engineering Mathematics-I

(Common to All Branches)

Max. Marks: 70   Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1.   Solve $x\dfrac{dy}{dx} + y = x^3 y^6$ 14M

OR

2.   A body originally at 80° C cools down to 60° C in 20 minutes, the temperature of the air being 40° C. What will be the temperature of the body after 40 minutes from the original and when will be the temperature be 50° C.   14M

UNIT–II

3.   Solve $(D^2 + 4)y = x^2 + \cos 2x$ 14M

OR

4.   Using the method of variation of parameters, solve $(D^2 + 4)y = \tan 2x$ 14M

UNIT–III

5.   a)   Verify Rolle's theorem for $f(x) = \dfrac{\sin x}{e^x} in (0, f)$ 7M

     b)   Expand $\sin x$, by using Maclaurin's theorem.   7M

OR

6.   a)   Verify Lagrange's Mean value theorem for $f(x) = e^x in [0,1]$ 7M

     b)   Using Maclaurin's series, expand $f(x) = \log(1 + x)$ 7M

UNIT–IV

7.   If $u = x^2 - 2y, v = x + y + z, w = x - 2y + 3z$,then find $\dfrac{\partial(u, v, w)}{\partial(x, y, z)}$ 14M

OR

8.   Find the maximum and minimum values of $x^3 + y^3 - 3axy$ 14M

UNIT–V

9.   Trace the curve $r = a(1 - \cos_{\shortparallel})$ 14M

OR

10. Trace the curve $x^3 + y^3 = 3axy$ 14M

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R-15

Code: 5GC13

I B.Tech. I Semester Supplementary Examinations October 2020

Engineering Physics

(Common to EEE & ECE)

Max. Marks: 70

Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Explain the interference due to thin films and draw the conditions for constructive and destructive interference.   10M

   b) Distinguish between interference and diffraction of light.   4M

OR

2. a) Define interference of light.   4M

   b) Explain Fraunhoffer diffraction of light at single slit and its intensity distribution.   10M

UNIT–II

3. Show that FCC crystal is more tightly packed than BCC and SC crystal based on the packing fractions of the corresponding crystals.   14M

OR

4. a) Explain the terms

   (i) screw and edge dislocations   (ii) Burger's vector.   10M

   b) For a simple cubic lattice find the ratios of interplanar separation $d_{111}:d_{110}:d_{100}$ 4M

UNIT–III

5. a) Calculate the wavelength associated with electron with energy 2000eV.   4M

   b) Distinguish between classical free electron theory and quantum free electron theory of metals.   10M

OR

6. a) Develop Schroendinger's time dependent wave equation.   8M

   b) State and explain Heisenberg's uncertainty principle.   6M

UNIT–IV

7. Define magnetic dipole moment. List out various sources of magnetic dipole moment in magnetic materials.   14M

OR

8. Explain the concept of drift and diffusion currents. Derive Einstein relation in semiconductors.   14M

UNIT–V

9. Explain in detail the synthesis of nano materials using

   (i) Plasma arching and (ii) Thermal evaporation methods.   14M

OR

10. a) Mention the significance of penetration depth in superconductors.   7M

    b) Explain properties of superconductors.   7M

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Code: 5G111

I B.Tech. I Semester Supplementary Examinations October 2020

Problem Solving Techniques and Introduction to C Programming

(Common to All Branches)

Max. Marks: 70   Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Give a comparison between system and application softwares with examples.

    b) Write an algorithm to find the greatest number among the three given numbers.

OR

2. a) Give the block diagram of a computer. Explain functionality of each component.

    b) Write an algorithm to calculate the roots of a quadratic equation.

UNIT–II

3. a) What is the need of explicit type conversion in C? How to cast the data?

    b) What is an integer constant, floating constant and character constant? Give valid examples.

OR

4. Explain with examples the different types of operators used in C.

UNIT–III

5. a) In what way a do – while loop differs from while loop. Explain.

    b) Write a C program to print all the prime numbers between 1 to 100

OR

6. a) How does a switch statement works? List the difference between switch and if else ladder statement.

    b) Write a program to demonstrate 'goto' statement.

UNIT–IV

7. a) Write a program to print an array in reverse order

    b) Write a C Program to delete 'n' characters in a given string

OR

8. a) What is an Array? Explain different types of Array with examples.

    b) What is String? Explain any three string handling functions with examples.

UNIT–V

9. a) What is the scope of variables of type extern, auto, register and static? Explain with example.

    b) What is meant by user defined function? Explain with an example C program

OR

10. a) What is a function? What are its advantages? Explain various parameter passing techniques.

    b) Write a function that checks whether a given year is leap year or not.

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R-15

Code: 5G311

I B.Tech. I Semester Supplementary Examinations October 2020
Electronic Devices and Circuits-I
(Common to EEE & ECE)

Max. Marks: 70   Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1.	a)	Write about various types of sources used in circuits.	7M
	b)	Distinguish between different passive elements.	7M

OR

2.	a)	Summarize different types of capacitors and inductors.	7M
	b)	Outline the importance of tolerance band in color coding of resistors.	7M

UNIT–II

3.	a)	State and prove Ohm's law with an example.	6M
	b)	What is the concept of super node and super mesh? Explain.	8M

OR

4.	a)	Define and prove Kirchhoff's Current law with an example.	7M
	b)	Label and prove Kirchhoff's Voltage law with an example.	7M

UNIT–III

5.	a)	Summarize the effect of temperature on the V-I characteristics of PN junction diode.	7M
	b)	Outline the operation of PN-Diode in Forward and reverse bias conditions.	7M

OR

6.	a)	Derive the expression for transition capacitance (C_T) of PN-junction diode.	6M
	b)	Discuss about breakdown mechanisms in semiconductor diodes.	8M

UNIT–IV

7.	a)	Define the following terms with expressions i) PIV ii) Average DC voltage iii) RMS Current iv) Ripple factor.	8M
	b)	Distinguish between Half wave and full wave rectifier rectifiers.	6M

OR

8.	a)	Write the principle of operation of Full wave rectifier with relevant diagrams and also mention applications of it.	8M
	b)	Distinguish between L-section and -section filters.	6M

UNIT–V

9.	a)	Explain the working principle of NPN transistor	8M
	b)	What is early effect? How does it modify the V-I characteristics of a BJT.	6M

OR

10.	a)	Discuss about the input and output characteristics of BJT in CB configuration.	8M
	b)	Elaborate the working principle of NPN transistor with neat diagrams.	6M

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