Code: 19A221T

I B.Tech. II Semester Regular Examinations Nov/Dec 2020

Basic Electrical and Electronics Engineering

(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours

Answer *any five* questions from the following (5 x 14 = 70 Marks)

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			Marks	CO	Blooms Level
1.	a)	Obtain the equivalent inductance of three parallel connected inductors of value 10 mH.	7M	CO1	L3
	b)	Three capacitors of 2 mF, 5 mF and 10 mF are connected in series. Find the equivalent capacitance	7M	CO1	L3
2.	a)	Three resistances of R ohms are connected in delta. Transform it into an equivalent star with resistances R1, R2 and R3.	7M	CO1	L3
	b)	Four resistors of 2 ohm, 3 ohm, 4 ohm & 5 ohm respectively, are connected in parallel. What potential difference must be applied to the group in order that total power of 100 W may be absorbed?	7M	CO1	L3
3.	a)	Explain the speed control methods used for dc motors.	7M	CO2	L2
	b)	A 4 pole lap wound d.c generator is running at 1500 rpm, flux is 7 mwb, number of slots is 52, conductors per slot is 20. Calculate the generated voltage.	7M	CO2	L3
4.	a)	List out different types of losses present in transformer	7M	CO2	L1
	b)	What is voltage regulation? Explain about synchronous impedance method of finding regulation.	7M	CO2	L4
5.	a)	How is a rotating magnetic field produced in a three phase induction motor? Explain in detail with relevant phasors.	7M	CO2	L5
	b)	Give the difference between an induction motor and a transformer.	7M	CO2	L2
6.	a)	Explain the operation of bridge rectifier with relevant diagrams.	7M	CO3	L2
	b)	Explain about the principle of operation of PNP transistor? Discuss how it is operated as an amplifier?	7M	CO3	L4
7.	a)	Give a comparison between induction heating and dielectric heating	7M	CO4	L5
	b)	Describe the function of Cathode Ray Tube (CRT) with schematic diagram.	7M	CO4	L2
8.	a)	Explain various applications of CRO.	7M	CO4	L2
	b)	Explain about dielectric heating with relevant diagrams.	7M	CO4	L2

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Code: 19AC21T

I B.Tech. II Semester Regular Examinations Nov/Dec 2020
Differential Equations and Vector Calculus
(Common to All Branches)

Max. Marks: 70   Time: 3 Hours

Answer *any five* questions from the following (5 x 14 = 70 Marks)
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			Marks	CO	Blooms Level

1. a) Solve $\dfrac{d^2 y}{dx^2} + 16y = x\sin 3x$ — 7M — CO1

   b) Solve $y^{11} - 2y^1 + 2y = x + e^x \cos x$ — 7M — CO1

2. Using method of variation of parameters, solve
   $y^{11} - 2y^1 + y = e^x \log x$ — 14M — CO1

3. Solve $x^2 \dfrac{d^2 y}{dx^2} + x\dfrac{dy}{dx} + y = \log x \sin(\log x)$ — 14M — CO2

4. Solve $(2x - 1)^2 \dfrac{d^2 y}{dx^2} + (2x - 1)\dfrac{dy}{dx} - 2y = 8x^2 - 2x + 3$ — 14M — CO2

5. Solve $(p^2 + q^2)y = qz$ by Charpit's method. — 14M — CO3

6. a) Find the directional derivative of $f(x, y, z) = xy^3 + yz^3$ at the point (2, -1, 1) in the direction of the vector $\bar{i} + 2\bar{j} + 2\bar{k}$. — 7M — CO4

   b) Prove that $div(r^n \bar{r}) = (n + 3)r^n$ — 7M — CO4

7. a) If $\bar{f} = grad[x^3 y + y^3 z + z^3 x - x^2 y^2 z^2]$ then find $div\,\bar{f}$ and $curl\,\bar{f}$. — 7M — CO4

   b) If $\bar{F} = (5xy - 6x^2)\bar{i} + (2y - 4x)\bar{j}$, evaluate $\int_C \bar{F}.d\bar{r}$ along the curve C in the xy-plane, $y = x^3$ from the point (1, 1) to (2, 8). — 7M — CO4

8. Verify Green's theorem for $\int_C [(3x - 8y^2)dx + (4y - 6xy)dy]$ where c is the boundary of the region bounded by x = 0 , y = 0 and x + y = 1. — 14M — CO5

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Code: 19A324T-B

I B.Tech. II Semester Regular Examinations Nov/Dec 2020
Engineering Graphics & Design
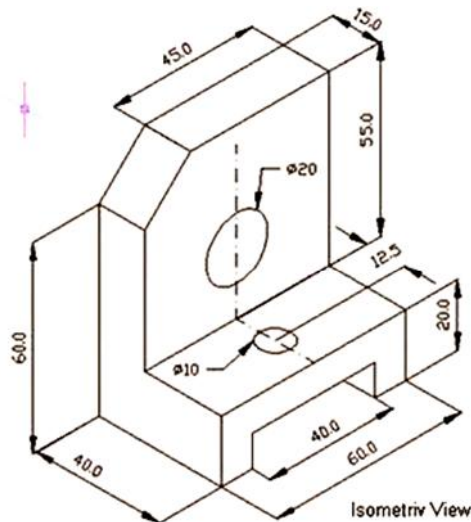(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *any five* questions from the following (5 x 14 = 70 Marks)
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			Marks	CO	Blooms Level
1.		Construct a parabola when the distance between the focus and the directrix is 40mm. Draw tangent and normal at any point P on the curve.	14M	CO1	L3
2.	a)	Construct a regular hexagon of side 30mm when one side is (i) horizontal and (ii) vertical.	7M	CO1	L3
	b)	Construct a regular pentagon with 50mm side by using general method.	7M	CO1	L3
3.		A circle of 40mm diameter rolls on a horizontal line without slipping. Draw the curve traced by a point R on the circumference of the circle for one complete revolution.	14M	CO2	L3
4.	a)	Draw the projections of a point F which lies in both the H.P. and V.P.	7M	CO3	L3
	b)	Draw the projections of a straight line CD 50mm long, parallel to H.P. and inclined to V.P. the end C is 10mm in front of V.P. and D is 30mm in front of V.P. the line is 15mm above H.P.	7M	CO3	L3
5.		A line measuring 75mm long is inclined at an angle of 45^0 to the H.P. and 30^0 to V.P. The point P is 15mm above H.P. and 20mm in front of V.P. Draw the projections of the line.	14M	CO3	L3
6.		Draw the projections of a triangular plate of side 25mm has its surface resting on the VP and edge inclined at 45^0 to HP.	14M	CO4	L3
7.		Draw the projections of a hexagonal prism, base 30mm side and height 55mm has its axis inclined at 30^0 to the HP and has an edge of its base, on the HP and inclined at 60^0 to the VP.	14M	CO5	L3
8.		Convert the following isometric view to orthographic front and top views	14M	CO5	L3

Isometriv View

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Code: 19A324T-A

I B.Tech. II Semester Regular Examinations Nov/Dec 2020

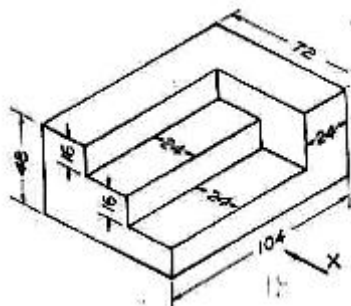# Engineering Graphics & Design

(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours

Answer *any five* questions from the following (5 x 14 = 70 Marks)

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			Marks	CO	Blooms Level
1.		Construct an ellipse when the distance between the focus and the directrix is 30mm and the eccentricity is 3/4. Draw the tangent and the normal at any point P on the curve using directrix.	14M	CO1	L3
2.	a)	Construct a regular pentagon of side 40mm.	7M	CO1	L3
	b)	Draw an arc of radius 30mm touching two given straight lines which makes an obtuse angle of 135^0 between them.	7M	CO1	L3
3.		Draw an epicycloid of a rolling circle 40mm, which rolls outside another circle of 150mm diameter for one complete revolution.	14M	CO2	L3
4.		Draw an involute of a given equilateral triangle of side 25mm. Also draw a normal and a tangent at any point on the involute.	14M	CO2	L3
5.	a)	Draw the projections of a point A lying in V.P. and 35mm above H.P.	7M	CO3	L3
	b)	A line GH 45mm long is in the H.P. and inclined to the V.P. the eng G is 15mm in front of V.P. the length of the front view is 35mm. draw the projections of the line. Determine its inclination to the V.P.	7M	CO3	L3
6.		Draw the projections of a pentagonal plate of side 40mm which is placed with a side on HP and surface inclined at 30^0 to HP and kept perpendicular to VP.	14M	CO4	L3
7.		The front view of a rectangle plate having dimensions 70mm 40mm looks to be a square of 40mm, if the shortest side of the plate is on the VP and inclined at 45^0 to the HP. Draw its top view.	14M	CO4	L3
8.		Convert the following isometric view to orthographic view	14M	CO5	L3

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Code: 19A521T / 19A522T

I B.Tech. II Semester Regular Examinations Nov/Dec 2020

Python Programming / Programming Through Python

(Common to CE, ME & CSE)   (Common to EEE & ECE)

Max. Marks: 70   Time: 3 Hours

Answer *any five* questions from the following (5 x 14 = 70 Marks)

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			Marks	CO	Blooms Level
1.		Describe the various expressions in python with suitable examples.	14M	CO1	L1
2.	a)	Define a program that displays different data types using variables and literal constants.	7M	CO1	L1
	b)	Show that for a program to perform addition, subtraction, multiplication, integer division, floor division and modulo division (on two integers and float) python data types are crucial.	7M	CO1	L1
3.	a)	Illustrate the need and importance of function in python.	7M	CO2	L3
	b)	What is python List? Describe the List usage with suitable examples	7M	CO2	L1
4.	a)	Model a program to exchange the value of two variables with temporary variables	7M	CO2	L3
	b)	Examine the properties of Dictionary keys with examples	7M	CO2	L3
5.	a)	Write a python program to count the number of vowels in a string provided by the user.	7M	CO3	L3
	b)	Determine the need of Exception with Arguments.	7M	CO3	L3
6.	a)	Define classes in python with suitable example	7M	CO4	L1
	b)	Recall the fundamental object oriented concepts used in python.	7M	CO4	L1
7.		Describe the concept of queue implementation using python list.	14M	CO5	L1
8.		Examine abstract data type with its types along with the syntax used.	14M	CO5	L1 & L3

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I B.Tech. II Semester Regular Examinations Nov/Dec 2020
Applied Physics
(Computer Science and Engineering)

Max. Marks: 70   Time: 3 Hours
Answer *any five* questions from the following (5 x 14 = 70 Marks)
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			Marks	CO	Blooms Level
1.	a)	What is plane diffraction grating? Determine the wavelength of light source by using plane diffraction grating.	9M	CO1	L3
	b)	List the engineering application of diffraction.	5M	CO1	L2
2.	a)	Summarize the polarization by double refraction.	6M	CO1	L2
	b)	Give the construction and working of quarter wave plate and a half wave plate.	8M	CO1	L2
3.	a)	What is internal field? Derive the expression for internal field in dielectrics.	10M	CO2	L2
	b)	Give the applications of dielectrics.	4M	CO2	L2
4.	a)	Describe the origin of permanent magnetic moment in an atom.	7M	CO2	L2
	b)	Distinguish between soft and hard magnetic materials.	7M	CO2	L2
5.	a)	Define acceptance angle and numerical aperture. Derive an expression for acceptance angle and numerical aperture for an optical fiber.	10M	CO3	L3
	b)	The refractive indices of core and cladding materials of a step index fiber are 1.482 and 1.456. Calculate the following parameters (i) numerical aperture (ii) acceptance angle (iii) critical angle (iv) fractional refractive indices change.	4M	CO3	L3
6.	a)	Discuss the drift and diffusion currents in semiconductors.	7M	CO4	L2
	b)	Distinguish between direct band gap and indirect band gap of semiconductors.	7M	CO4	L2
7.	a)	Differentiate intrinsic and extrinsic semiconductors with suitable examples.	8M	CO4	L2
	b)	Derive Einstein relation in semiconductors.	6M	CO4	L2
8.	a)	Distinguish between type-I and type-II superconductors	7M	CO5	L2
	b)	What is superconductivity? List the applications of superconductors.	7M	CO5	L2

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