(4)

Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)
Munshi Nagar, Andheri (W) Mumbai – 400058

Re-Examinations- January 2020

Program: Civil/Mechanical/Electrical
Course Code: BS-BT101
Course Name: Engineering Mathematics I

Duration: 3 hours
Maximum Points: 100
Semester: I

Instructions:
1. Question No 1 is compulsory.
2. Attempt any four questions out of remaining six.

Q.No.	Questions	Points	CO	BL	PI
1(a)	Find the angle between the two surfaces $x^2+y^2+z^2=6$ and $z=4-y^2-xy$ at $(1,1,2)$	6	4	ii, v	1.1.1
1(b)	If $\alpha=i+1,\ \beta=1-i$ & $\tan\phi=\frac{1}{x+1}$, prove that $\frac{(x+\alpha)^n-(x+\beta)^n}{\alpha-\beta}=\sin n\phi\cdot\operatorname{cosec}^n\phi$	6	3	i, iv	2.4.1
1(c)	If $y=\cos\left[\log\left(x^2-2x+1\right)\right]$, prove that $(x-1)^2 y_{n+2}+(2n+1)(x-1)y_{n+1}+\left(n^2+4\right)y_n=0$	8	1	ii, iii	2.4.1
2(a)	Prove that $\frac{\sin 5\theta}{\sin\theta}=16\cos^4\theta-12\cos^2\theta+1$	6	3	i, ii	2.4.1
2(b)	If $y=\frac{2x-1}{(x-1)^2(x+2)}$, find y_n	6	1	ii, iii	2.4.1
2(c)	Find the value of n so that $v=r^n\left(3\cos^2\theta-1\right)$ satisfies the equation $\frac{\partial}{\partial r}\left(r^2\frac{\partial v}{\partial r}\right)+\frac{1}{\sin\theta}\frac{\partial}{\partial\theta}\left(\sin\theta\frac{\partial v}{\partial\theta}\right)=0$	8	2	iii iv	1.1.1
3(a)	Expand $x^4-3x^3+2x^2-x+1$ in positive powers of $(x-1)$	6	1	ii, iii	2.4.1

3(b)	If $u=\dfrac{e^{x+y+z}}{e^x+e^y+e^z}$, Prove that $u_x+u_y+u_z=2u$	6	2	i, iii	2.4.1
3(c)	If $\cosh x=\sec\theta$, prove that (i) $x=\log(\sec\theta+\tan\theta)$ (ii) $\theta=\dfrac{\pi}{2}-2\tan^{-1}(e^{-x})$ (iii) $\tanh\left(\dfrac{x}{2}\right)=\tan\dfrac{\theta}{2}$	8	3	ii, v	1.1.1
4(a)	If $\sin(\alpha+i\beta)=x+iy$, Prove that (i) $\dfrac{x^2}{\cosh^2\beta}+\dfrac{y^2}{\sinh^2\beta}=1$ (ii) $\dfrac{x^2}{\sin^2\alpha}-\dfrac{y^2}{\cos^2\alpha}=1$	6	3	i, ii	1.1.2
4(b)	If $u=f\left(\dfrac{y-x}{xy},\dfrac{z-x}{xz}\right)$, Prove that $x^2\dfrac{\partial u}{\partial x}+y^2\dfrac{\partial u}{\partial y}+z^2\dfrac{\partial u}{\partial z}=0$	6	2	ii, iv	2.4.1
4(c)	Find all the stationary points of the function $f(x,y)=x^3+3xy^2-15x^2-15y^2+72x$ and examine whether the function is maximum or minimum at those points.	8	2	ii, iii	1.1.1
5(a)	Find the unit normal vector to the surface $x^2y+2xz=4$ at $(2,-2,3)$	6	3	i, ii	2.4.1
5(b)	Prove that $\log(1+\tan x)=x-\dfrac{x^2}{2}+\dfrac{2}{3}x^3-\dfrac{7}{12}x^4+\cdots$	6	1	ii, iii	2.4.1
5(c)	If $x=u+v+w$, $y=uv+vw+uw$, $z=uvw$, Prove that $x\dfrac{\partial\phi}{\partial x}+2y\dfrac{\partial\phi}{\partial y}+3z\dfrac{\partial\phi}{\partial z}=u\dfrac{\partial\phi}{\partial u}+v\dfrac{\partial\phi}{\partial v}+w\dfrac{\partial\phi}{\partial w}$ where $\phi=\phi(x,y,z)$	8	2	iv, v	1.1.1
6(a)	Prove that $\cos\left[i\log\left(\dfrac{a-ib}{a+ib}\right)\right]=\dfrac{a^2-b^2}{a^2+b^2}$	6	3	ii, iii	1.1.1

6(b)	If $u = \tan^{-1}\left(\frac{x^3+y^3}{x-y}\right)$, Prove that $x^2\frac{\partial^2 u}{\partial x^2} + 2xy\frac{\partial^2 u}{\partial x \partial y} + y^2\frac{\partial^2 u}{\partial y^2} = \sin 4u - \sin 2u$	6	2	iv, v	2.4.1
6(c)	Find the Directional Derivative of $\phi = xy^2 + yz^3$ at $(1,-1,1)$ along the direction of normal to the surface $x^2+y^2+z^2=9$ at $(1,2,2)$	8	4	i, ii	1.1.1
7(a)	If $u = \cos\left(\frac{xy+yz}{x^2+y^2+z^2}\right) + \sin\left(\sqrt{x}+\sqrt{y}+\sqrt{z}\right)$ Find $x\frac{\partial u}{\partial x} + y\frac{\partial u}{\partial y} + z\frac{\partial u}{\partial z}$	6	2	ii, iii	1.1.1
7(b)	If ω is a complex cube root of unity, prove that $(1-\omega)^6 = -27$	6	3	i, iv	1.1.2
7(c)	If $y = x\log\left[(ax)^{-1} + a^{-1}\right]$, where '$a$' is a constant, prove that $x(x+1)\frac{\partial^2 y}{\partial x^2} + x\frac{\partial y}{\partial x} = y - 1$	8	2	ii, iii	2.4.1

(1).

SARDAR PATEL COLLEGE OF ENGINEERING

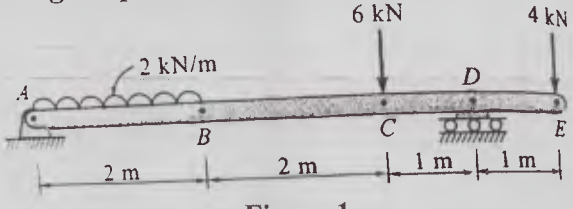
(Government Aided Autonomous Institute)
Munshi Nagar, Andheri (W) Mumbai – 400058

Re-Examination - January 2020

Program: F.Y. B.Tech (C/M/E)
Course Code: ES-BT104
Course Name: Engineering Mechanics-I

Duration: 03 hours
Maximum Points: 100 marks
Semester: I

Notes: 1. Attempt **any FIVE** questions out of **SEVEN** questions.
2. Assume suitable data wherever required and state it clearly.
3. Figures to the right indicate full marks.

Q.No.	Questions	Points	CO	BL	PI
Q.1.					
a)	A body is acted upon by forces as below. Find the resultant of these forces. i) 60 N acting due east ii) 120 N, 60^0 North of East iii) 90 N, 30^0 West of North iv) 150 N acting 60^0, South of West v) 110 N acting 20^0 West of South vi) 100 N acting 80^0 South of East. All the forces are acting from the point 'O'.	08	CO1	L1, L2	1.3.1, 2.1.1, 2.1.2, 2.1.3
b)	Determine the support reactions of the beam shown in **figure 1** below **using the principle of virtual work.**  **Figure 1.**	12	CO3	L1	1.3.1, 2.1.1, 2.1.2, 2.1.3, 2.2.3
Q.2.					
a)	Two cylinder of diameters 100 mm and 50 mm, weighing 200N and 50 N, respectively are placed in a trough as shown in **Figure 2**. Neglecting friction, find the reactions at contact surfaces 1, 2, 3 and 4.	10	CO2	L1, L2, L3	1.3.1, 2.1.1, 2.1.2, 2.1.3, 2.2.3

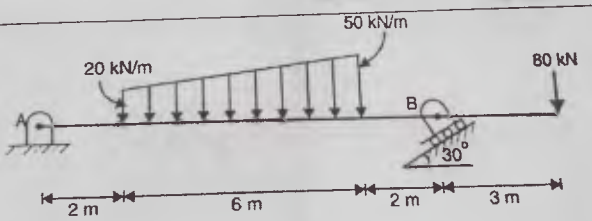
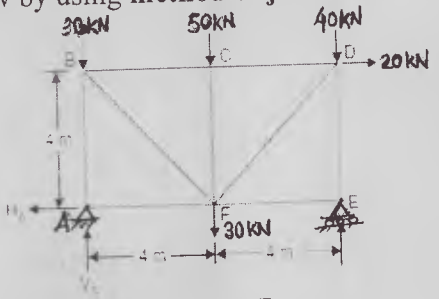
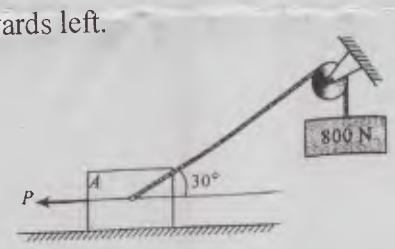
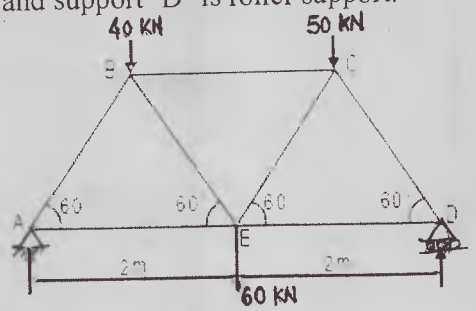


Figure 6.

b)	Determine the forces in all the members of the truss shown in **figure 7** below by using **method of joints**.  **Figure 7.**	12	CO2	L1	1.3.1, 2.1.1, 2.1.2, 2.1.3, 2.2.3
Q.5					
a)	State the assumptions made in the analysis of trusses.	05	CO2	L3	1.3.1
b)	Block A shown in **figure 8** weighs 2000 N. The chord attached to A passes over a fixed drum and supports a weight equal to 800 N. The value of coefficient of friction between A and horizontal plane is 0.30 and that between the rope and the fixed drum is 0.15. Determine the value of 'P' if motion is impending towards left.  **Figure 8.**	05	CO2	L1, L2, L3	1.3.1, 2.1.1, 2.1.2, 2.1.3, 2.4.1
c)	Using **method of sections**, determine the forces in members BC, CE and ED for the truss shown in **figure 9.** The support 'A' is hinged and support 'D' is roller support.  **Figure 9.**	10	CO2	L1	1.3.1, 2.1.1, 2.1.2, 2.1.3, 2.2.3
Q.6.					
a)	Three blocks A, B and C are placed as shown in **figure 10.** Determine the maximum value of 'P' that can be applied before any slipping takes place.	12	CO2	L1, L2, L3	1.3.1, 2.1.1, 2.1.2

019 (L)

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End-Sem-I ~~KT-Exam~~ Re-exam
JAN. 2019

Max. Marks: **75 marks** Duration: **180 Min**
Class: F.Y B.TECH **C/M/E** Semester: **I** Program:
Name of the Course: **Applied Chemistry –I** Course Code : BT-106

Instructions:

1 Question **No** (Q5) is compulsory
2 Attempt any 3 from Q1 Q2Q3 Q4

Que. No	Question	Points	CO	BL	PI
Q1					
a	Explain EDTA method for detection of hardness	**5**	1	2	2.2.3
b	What is temporary hardness and permanent hardness	**5**	1	1	1.2.1
c	Explain lime Zeolite process with chemical reactions. Write advantages its of Zeolite process	**10**	1	2	2.2.3
Q2					
a	Write short note on acid value of lubricant with significance	**5**	4	1	1.2.1
b	Define lubricant. Explain viscosity and viscosity index with significance	**5**	4	1	1.3.1
c	Classify different types of lubricant	**10**	4	2	2.2.4
Q3					
a	Explain COD method for detection of organic matter content with chemical reaction	**5**	3	2	2.2.3
b	Write short note on TDS and its importance	**5**	3	1	1.2.1
c	Describe ion-exchange method for removal of metal cation ions from hard water with advantages and disadvantages	**10**	3	2	2.2.4
Q4					
a	Write short note on carbon Nano tube	**5**	5	1	1.2.1
b	Explain applications of nanomaterials in different field	**5**	5	2	2.2.3
c	Explain the properties affected with Nano-size	**10**	5	2	2.2.3

Q5					
a	Convert the unit 20 PPM in to ^{0}Fr, ^{0}Cl, mg/L 10 ^{0}Cl in to ^{0}Fr , ppm, mg/L	5	1	2	2.1.3
b	Calculate the temporary , permanent and total hardness for water sample contain $Mg(HCO_3)_2$=10mg/L, $CaSO_4$= 10mg/L $CaCl_2$=10mg/L	5	1	3	3.2.1
c	25mL standard hard water containing 1.2 mg/mL CaCO3 consumed 50 mL of EDTA. 25mL of unknown hard water sample consumed 25 ml of EDTA using EBT as indicator. After boiling, filtration of same hard water(25 mL) consumed 10 mL of EDTA using EBT as indicator Calculate total, permanent and temporary hardness of water	5	1	3	3.2.1

(2)

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Re- examination (OLD)

ODD SEM January 2020

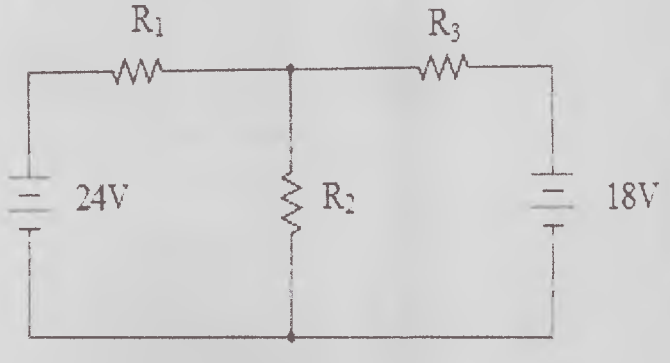
Program: C/M/E Engineering
Course code: [redacted]-BT102
Name of the Course: Basic Electrical ~~Engineering~~ Electronics I

Duration: 3 Hour
Maximum Marks: 100
Semester: I

Notes: 1) Solve any five questions.

2) Assume suitable data if necessary and state the assumption clearly.

3) Answers to all sub questions should be grouped together.

Q. No.	Questions	Pts	CO	BL
1	a) Explain any one method of starting a single phase AC motor in detail.	(05)	03	2
	b) Explain working principle of a transformer.	(05)	03	2
	c) List any five components of a DC machine and write any one use of these.	(05)	03	2
	d) Why three phase induction motor is self-starting? Explain in detail.	(05)	03	3
2	a) Use Superposition theorem to determine current through R1, R2 and R3. Given R1 = 10 Ω, R2 = 80 and R3 = 40 Ω. Verify the result with nodal and mesh analysis. 	(10)	01	3

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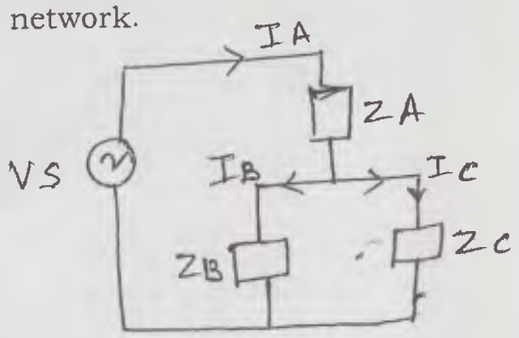
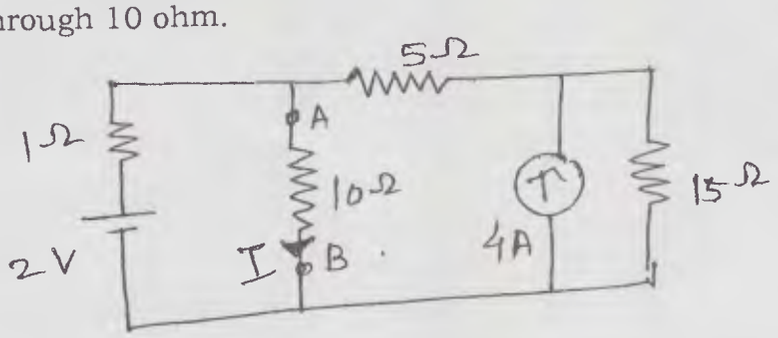
Re- examination (OLD)

ODD SEM January 2020

	b) In the circuits shown below $Z_A = 10 + j8$, $Z_B = 9 - j6$ and $Z_C = 3 + j2$. If voltage Vs = 50 $\angle 0^0$ determine currents I_A, I_B and Ic. Determine equivalent impedance and admittance of the network. Also determine power factor of the network. 	(10)	02	3
3	a) A series RLC circuit has a current which lags the applied voltage by 45^0. The voltage across the inductor has maximum value equal to twice maximum value of voltage across capacitor. The voltage across inductor is 300 sin(wt) and R= 20 ohm. Find the value of inductance and capacitance if supply frequency is 50 Hz.	(10)	02	3
	b) Using Thevenin's equivalent circuit determine current I through 10 ohm. 	(10)	02	2
4	a) A balanced 3 phase star connected load consists of a resistance in series with capacitance in each phase. The supply is 416 V, 3-phase, 50 Hz. Readings of the two wattmeters connected to measure power is 780 watt and 1980 watt. Calculate power factor, line current, resistance and capacitance of each phase.	(10)	02	3
	b) Find real, reactive and apparent power for each branch and calculate overall power factor of the circuit. Draw current phasors.	(10)	02	3

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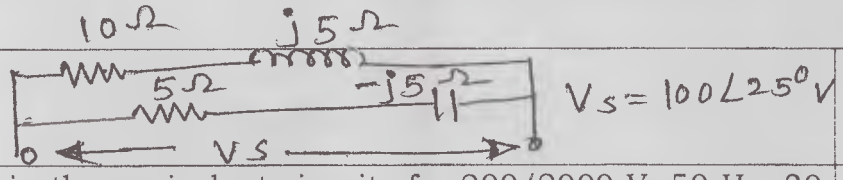
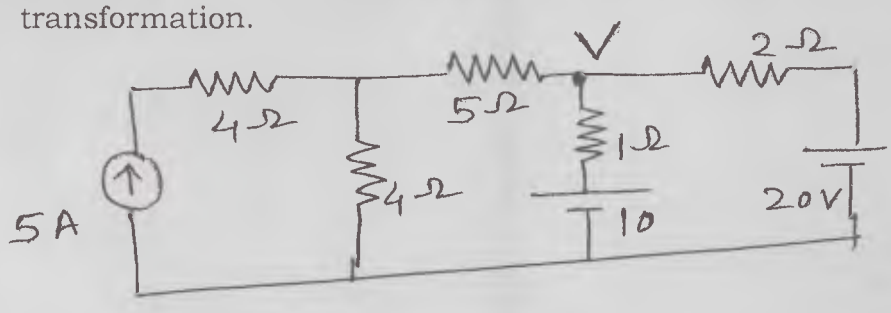
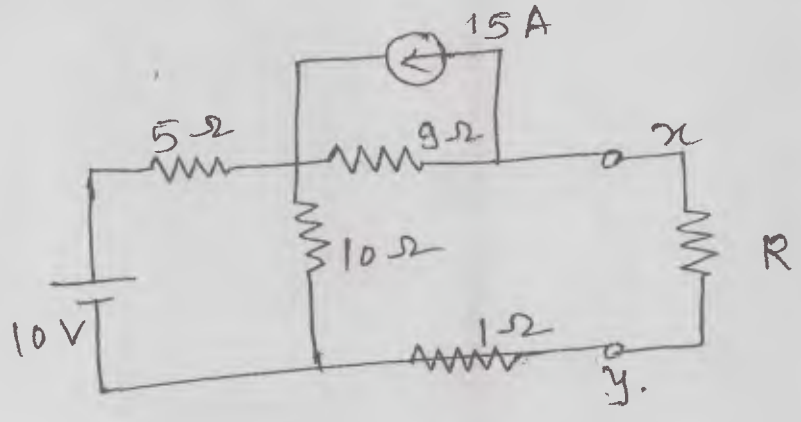
Re- examination (OLD)

ODD SEM January 2020



5	a) Obtain the equivalent circuit of a 200/2000 V, 50 Hz, 30 KVA single phase transformer from following test data: a. O.C. test: 200 V, 6.2 A, 360 W (on LV side) b. S.C. test: 75 V, 15 A, 600 W (on HV side)	(10)	03	4
	b) A 50 KVA single phase transformer of 2300 / 230 V has primary and secondary winding resistances of 2 ohm and 0.02 ohm respectively. The core loss is 412 Watt. Calculate efficiency at i) half load with 0.8 lagging pf (ii) full load with 0.8 leading pf.	(10)	03	3
6	a) Determine V in following circuit using source transformation. 	(10)	01	2
	b) Determine R for maximum power transfer. Also find maximum power. 	(10)	02	2

(L)

SARDAR PATEL COLLEGE OF ENGINEERING

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Munshi Nagar, Andheri (W) Mumbai – 400058

Re- examination

ODD SEM January 2020

Program: C/M/E Engineering
Course code: ES-BT102
Name of the Course: Basic Electrical Engineering

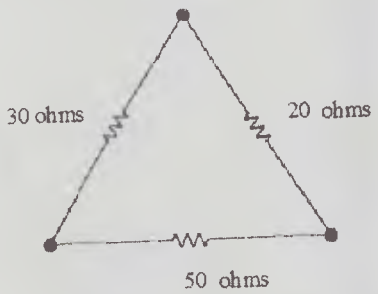
Duration: 3 Hour
Maximum Marks: 100
Semester: I

Notes: 1) Solve any five questions.

2) Assume suitable data if necessary and state the assumption clearly.

3) Answers to all sub questions should be grouped together.

Q. No.	Questions	Pts	CO	BL	PI
1	a) Convert given delta into star.	(05)	01	2	



1.3.1

	b) V= 25 sin (2t) is applied to a series combination of a resistor of 5 ohm and capacitor of 0.5μF. Determine peak current through capacitor. Also determine power factor of the circuit.	(05)	02	2	
	c) Explain working principle of a DC motor.	(05)	03	2	
	d) Can we calculate reactive power consumption in 3 – phase circuit with the help of two watt-meters? If yes how?	(05)	02	2	
2	a) Explain any one method of starting a single phase AC motor in detail.	(05)	03	2	
	b) Explain working principle of a transformer. Derive the equation for induced emf and turns ratio. Draw equivalent circuit of transformer referred to primary side.	(10)	03	2	1.3.1
	c) List any five components of a DC machine and write any one use of these.	(05)	03	3	

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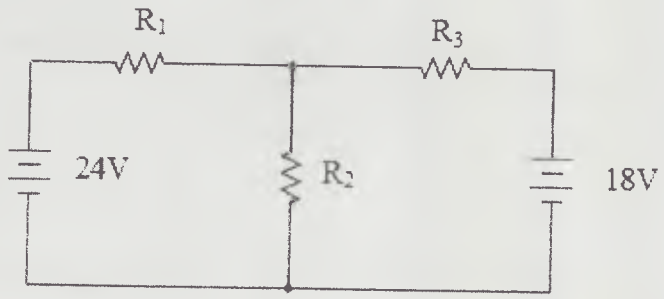
Re- examination

ODD SEM January 2020

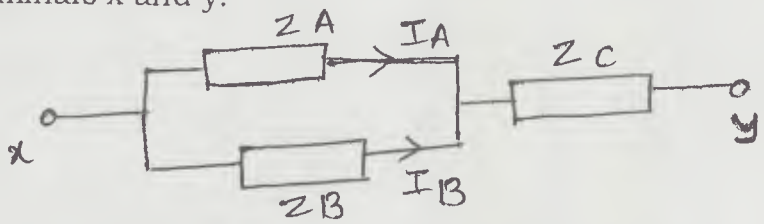
3 a) Use Superposition theorem to determine current through R1, R2 and R3. Given R1 = 50 Ω, R2 = 40 and R3 = 20 Ω. Verify the result with nodal and mesh analysis.

(10) 01 3



1.3.1

b) In the circuits shown below $Z_A = 10 + j8$, $Z_B = 9 - j6$ and $Z_C = 3 + j2$. If voltage across $Z_C = 100 \angle 0^0$ determine currents I_A and I_B. Also determine voltage across terminals x and y.



(10) 02 3

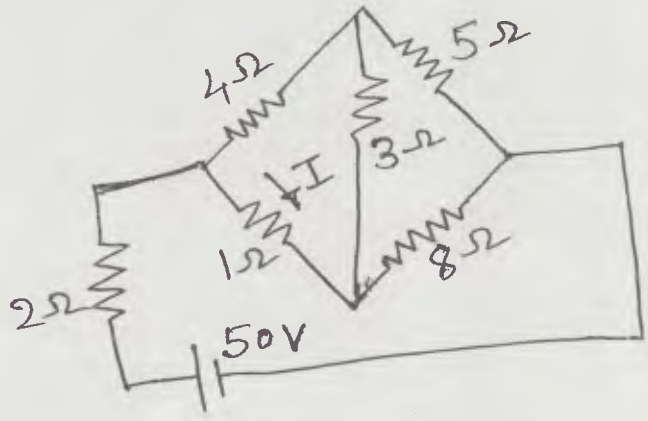
4 a) A series RLC circuit has a current which lags the applied voltage by 45^0. The voltage across the inductor has maximum value equal to twice maximum value of voltage across capacitor. The voltage across inductor is 300 sin(wt) and R= 20 ohm. Find the value of inductance and capacitance if supply frequency is 50 Hz.

(10) 02 3

b) Using Thevenin's equivalent find current I through 1 ohm.

1.3.1

(10) 02 2



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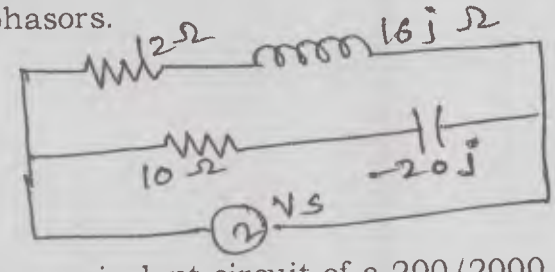
Re- examination

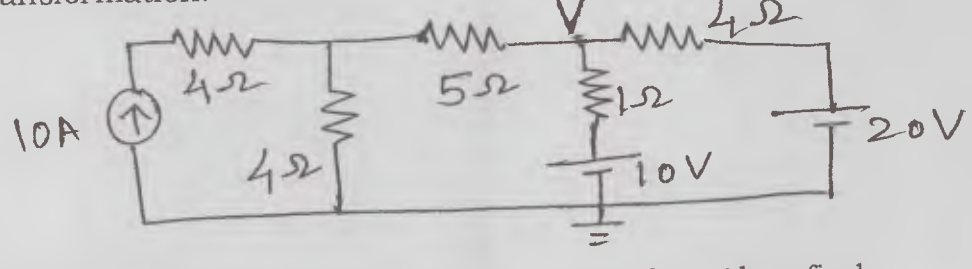
ODD SEM January 2020

5	a)	A balanced 3 phase star connected load consists of a resistance in series with capacitance in each phase. The supply is 416 V, 3-phase, 50 Hz. Readings of the two wattmeters connected to measure power is 780 watt and 1980 watt. Calculate power factor, line current, resistance and capacitance of each phase.	(10)	02	3
	b)	Find real, reactive and apparent power for each branch and calculate overall power factor of the circuit. Draw current phasors.	(10)	02	3

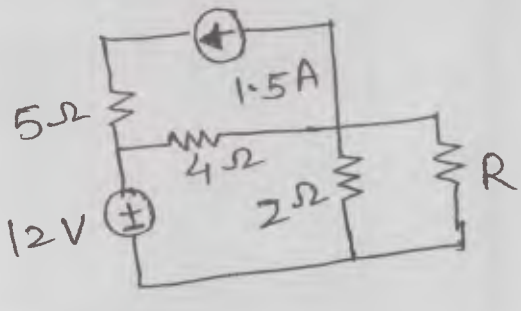


$V_s = 200 \angle 52.8^\circ V$

6	a)	Obtain the equivalent circuit of a 200/2000 V, 50 Hz, 30 KVA single phase transformer from following test data: a. O.C. test: 200 V, 6.2 A, 360 W (on LV side) b. S.C. test: 75 V, 15 A, 600 W (on HV side)	(10)	03	4
	b)	A 50 KVA single phase transformer of 2300 / 230 V has primary and secondary winding resistances of 2 ohm and 0.02 ohm respectively. The core loss is 412 Watt. Calculate efficiency at i) half load with 0.8 lagging pf (ii) full load with 0.8 leading pf.	(10)	03	3
	a)	Determine V in following circuit using source transformation.	(10)	01	2



	b)	Determine R for maximum power transfer. Also find maximum power.	(10)	02	2



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Old
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Munshi Nagar, Andheri (West), Mumbai – 400058.
Re-Examination Semester Exam
January 2020 (old syllabus 217-2018)

Max. Marks: 100 Duration: 03 hr
Class: F Y B.Tech (C/E/M) Semester: I Program: First Year Engineering
Name of the Course: Engineering Graphics I Course Code : BT 103
Instructions:

1. Attempt any five questions
2. Draw neat diagrams
3. Assume suitable data if necessary
4. Use first angle method of projection only.

Question No		Maximum Marks	Course Outcome Number	Module No
Q1 (a)	Elevation of line AB is 75 mm and is inclined to XY line at 45 0 . End A is 25 mm above H.P. and end B is 10 mm behind V.P. draw its projections , length of line AB is 95 mm and end B is in third quadrant. Find the inclination of the line with H.P.	10	I,II	2
Q1 (b)	Draw a curve of a circle of 40mm diameter which rolls inside another circle of 200mm diameter for one revolution.name the curve and Draw a tangent and normal at any point on it.	10	I,II	1
Q2 (a)	The front view of 85 mm long straight line AB measure 60 mm while its T.V. measures 70 mm. draw the projection of AB if its end A is 10 mm above the H.P. and 20mm behind the V.P. while its end B is in the first quadrant.determine the inclination of line AB with the reference plane. also locate its traces	10	I,II, III	3
Q2 (b)	Draw the involute of a regular pentagon of side 20 mm. draw tangent and normal at a point on the involute 80mm from the center of the pentagon	10	I,III	1
Q3 (a)	A pentagonal plate of 30 mm side has one of its side in the V.P. and inclined at 30 0 to the H.P. the corner opposite to this side contained by the H.P. is 20 mm in front of the V.P. draw the projections and find the inclination of as surface with the V.P.	10	I, III	4

Q3 (b)	A pentagonal plate of 30mm side has one of its side in the V.P. and inclined at 30^0 to the H.P. the corner opposite to this side contained by the H.P is 20 mm in front of the V.P. draw the projections and find the inclination of the surface with the V.P.	10	I, III	4
Q4 (a)	A pentagonal pyramid of 30 mm edge of base and 60 mm axis height is lying on one of its triangular surfaces in the V.P. so that the axis is inclined at an angle of 45^0 to the H.P. draw its front view and top view.	10	I, III	5
Q4 (b)	A Right circular cone , diameter of the base 60 mm and height of axis 80 mm is resting on a point of its base circle rim on H.P. with the apex 55 mm above the H.P. the axis of the cone makes an angle of 45^0 with the V.P. draw the projections of the cone when the apex is in the V.P.	10	I, III	5
Q5	A cone of base 70 mm diameter and axis 90 mm long is resting on its base on H.P. it is cut by section plane perpendicular to V.P. and parallel to and 15 mm away from one of its end generators. Draw the sectional T.V. , F.V., sectional S.V. and true shape of section	20	I , II, III, IV	6
Q6	A right circular cone the base 60 mm diameter and 60 mm height stands vertically with its base on the H.P. a semicircular hole of 36 mm diameter is drilled through the cone such that the axis of the hole is parallel to the H.P. and perpendicular to the V.P. and flat face of the hole is intersecting the axis of the cone 20 mm above the base. The flat face of hole is parallel to the H.P. and perpendicular to the V.P. draw the development of the lateral surface of the cone with the hole.	20	I , II, III, IV	7
Q7 (a)	A square pyramid edge of base 30 mm , axis height 50 mm rest on its base in the H.P. with one of the edge of base parallel to the V.P. a sectional plane which is the H.T. cut the pyramid at an angle 45^0 to the V.P. and is 6 mm away from the axis of pyramid. Draw the T.V. , sectional F.V. , sectional S.V. and true shape of section.	10	I, III, IV	6
Q7 (b)	A right hexagonal pyramid side of base 20 mm and height of axis 40 mm is resting on one of its triangular face on the ground (H.P.)and the edge of the base contained by that triangular face makes and angle 45 0 to the V.P. draw its projections considering the apex nearer to the V.P.	10	I, III	5

(4)

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SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)

Munshi Nagar, Andheri (W) Mumbai – 400058

Re-Exam January 2019 Examinations

Program: F.E.(Mechanical) **Duration:** 3hr

Course Code: ~~EIUU3~~ BS-BT103 **Maximum Points:** 100

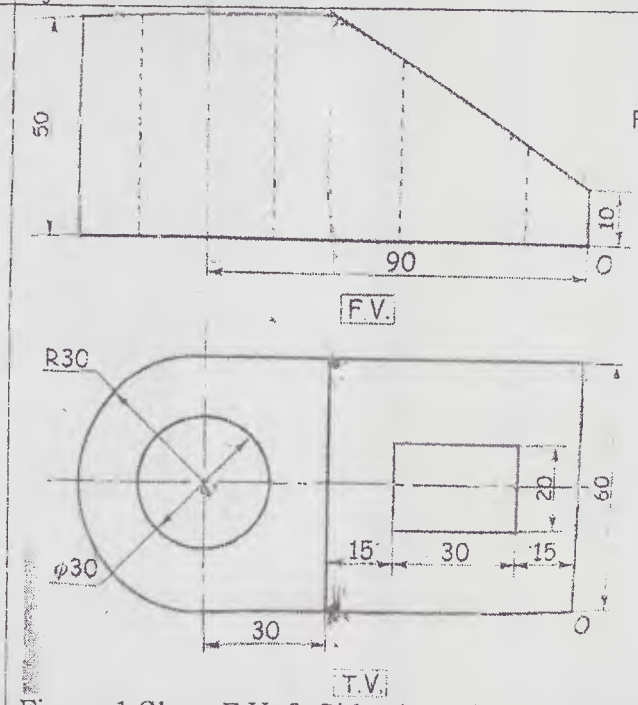
Course Name: Engineering Graphics -1 **Semester:** I

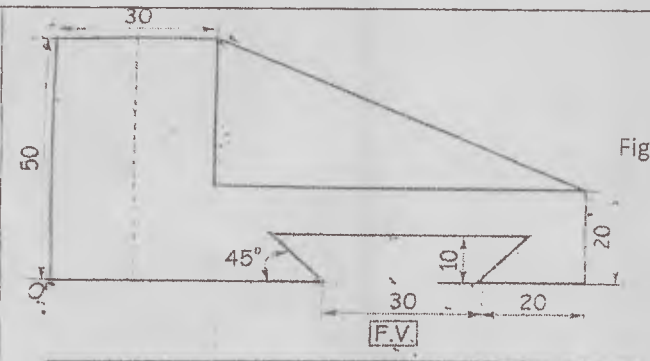
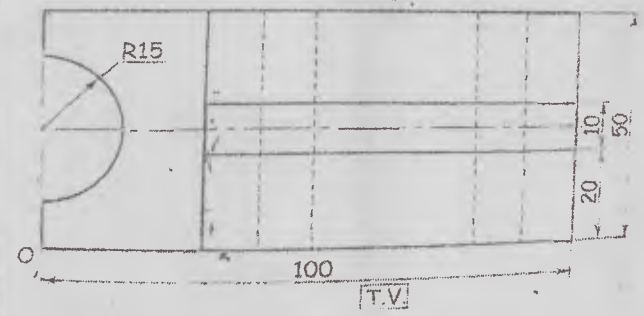
Exam Seat no.:

PC no. of student :

- Use only First Angle method of projection
- Figures to the right indicate full points
- Assume suitable data, wherever necessary.
- Students are required to save the drawings in the Folder assigned to them during examination, before leaving the examination room.
- Student will be responsible, if he fails to save the drawings of AUTOCAD in the Folder assigned to them during examination

Q.No.	Questions	Points	CO	BL	PI
Q.1 (A)	The end of a straight line AB 90 mm long, is in the second quadrant & 15 mm from both the H.P. & V.P. End B is in IIIrd quadrant. The line is inclined at 30 degree with the H.P. and the distance between the end projectors measured parallel to the XY line is 60 mm. Draw the projections of line. Find its inclination with V.P. Also locate the traces.	10	1,2,3	2	5.2.2
B	The F.V. of 85 mm long straight line AB measures 60 mm while its T.V. measures 70 mm. draw the projections of AB, if its end A is 10 mm above H.P.& 20 mm behind V.P., while its end B is in the first quadrant. Determine the inclination of the line AB with reference plane. Also locate the traces	10	1,2,3	2	5.2.2
Q.2 (A)	A rectangular plane ABCD with side BC =50 mm and AB = 30 mm has its surface inclined at an angle of 30 degree to the V.P. One of the shorter edge say (AB) is in the V.P. and makes an angle 45 degree with H.P. Draw its projections	10	1,2,3	2	5.2.2
B	A square lamina ABCD of 50 mm side rest on the corner A in the H.P. such that the plane is seen as a rhombus in the top view with diagonal contained by corner A measuring 25 mm. Another diagonal is inclined at 45 degree to V.P. & parallel to H.P. Draw its projections & determine surface inclination of the plane with the H.P.	10	1,2,3	2	5.2.2

Q.3 (A)	A Square pyramid side of base 40 mm, axis length 60 mm has one of the side of base in the H.P. The axis of a solid is inclined to the H.P. and the V.P. at an angle of 30 degree & 45 degree respectively. Draw its projections	10	1,2,3	2	5.2.2
B	A Pentagonal Prism having an edge of base 25 mm, axis height 60 mm has one of its corner in the H.P. The axis is inclined at 30 degree to H.P. and the T.V. of the axis is inclined at 45 degree to the V.P. draw the projections.	10	1,2,3	2	5.2.2
Q.4 (A)	The distance of a locus from the directrix is 50mm. A point moves in such a way that the eccentricity is equal to 3/2. Draw the locus of the point and name the curve.	10	1,2,3	2	5.2.2
B	Draw a helix on the cylinder of 60 mm diameter & height 50 mm on & also develop the surface of the cylinder	10	1,2,3	2	5.2.2
Q.5 (A)	 Figure-1 Figure 1 Show F.V. & Side view of an object. Draw the isometric view using 'O' as the Origin	10	4	2	5.2.2

B	 Figure-2  Figure 2 Show F.V. & Side view of an object. Draw the isometric view using 'O' as the Origin	10	4	2	5.2.2
Q.6	Figure 3 Show two views of an object. Redraw the given Front View, Top View & draw the missing LHSV view	20	4	2	5.2.2
Q.7	Figure 4 shows a Pictorial view of an object. Draw the F.V., T.V, R.H.S.V	20	4	2	5.2.2

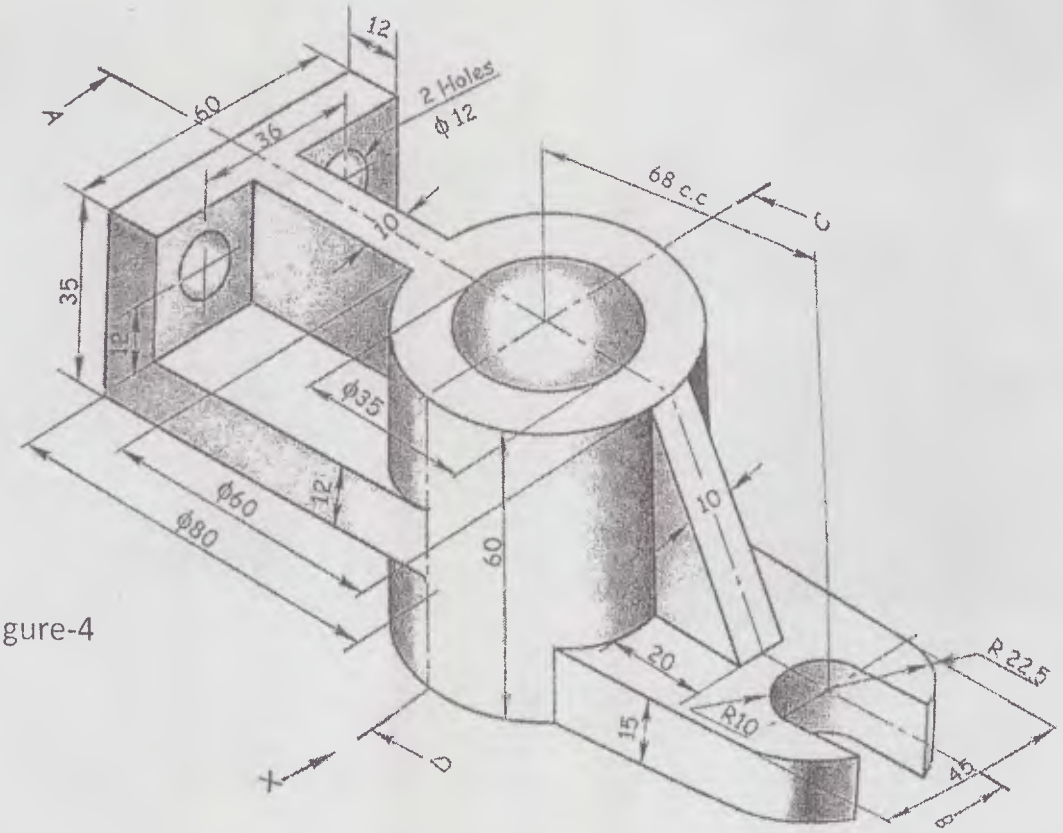


Figure-4

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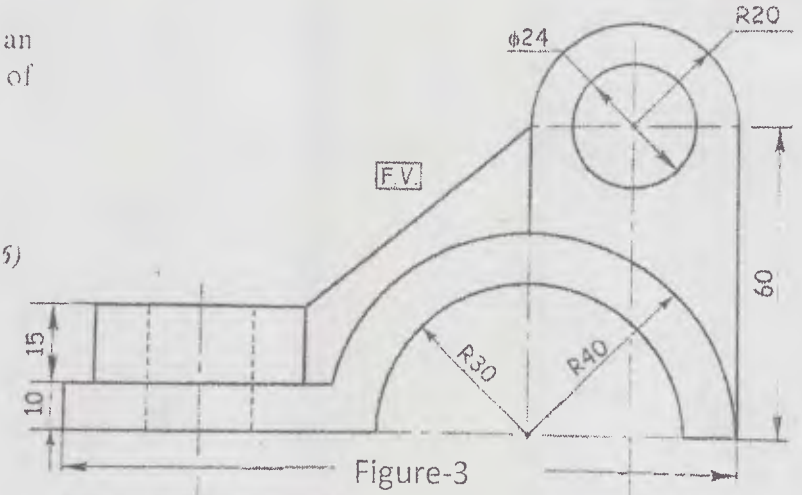


Figure-3

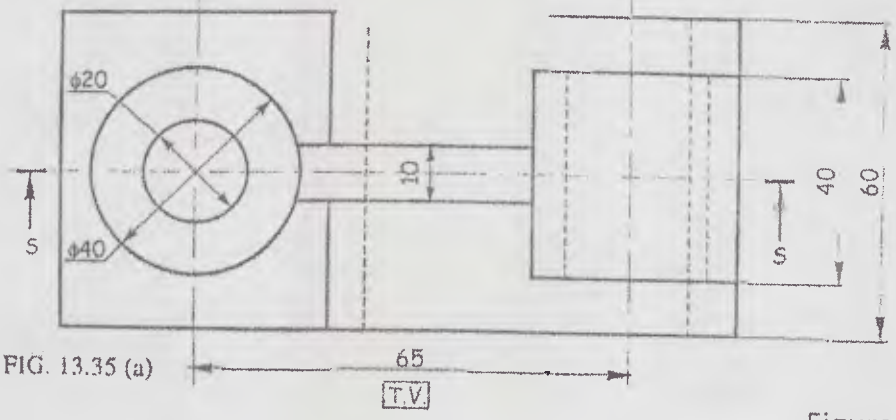


FIG. 13.35 (a)

Figure-3

(2) /

SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)
Munshi Nagar, Andheri (W) Mumbai – 400058

Re Exam January 2020

Program: F.Y. B.Tech Civil Engineering | **Duration:** 03 Hours

Course Code: ES-BT103 | **Maximum Points:** 100

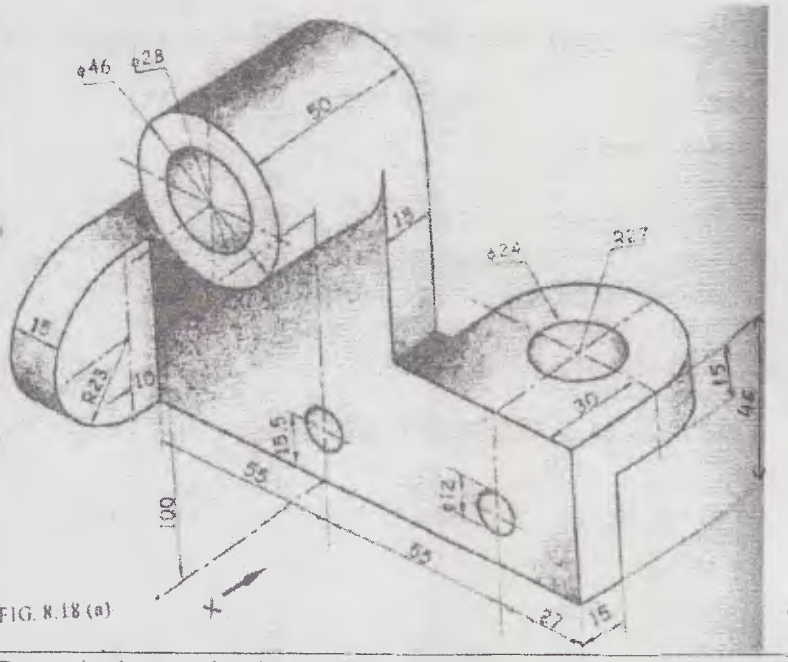
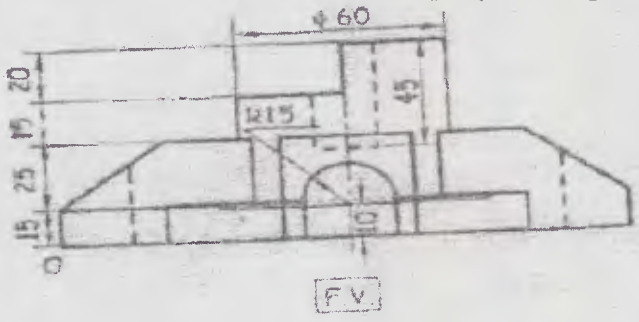
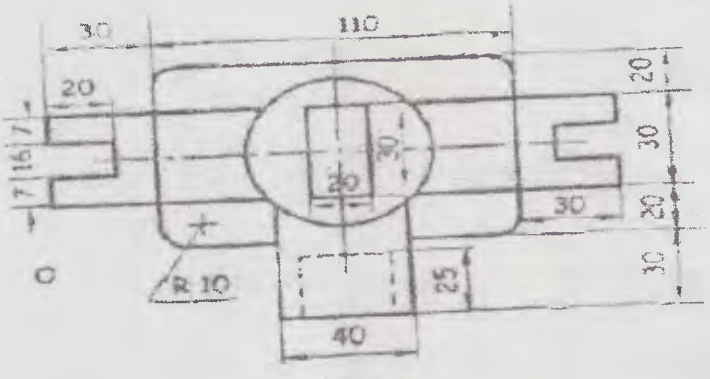
Course Name: Engineering Graphics I | **Semester:** I

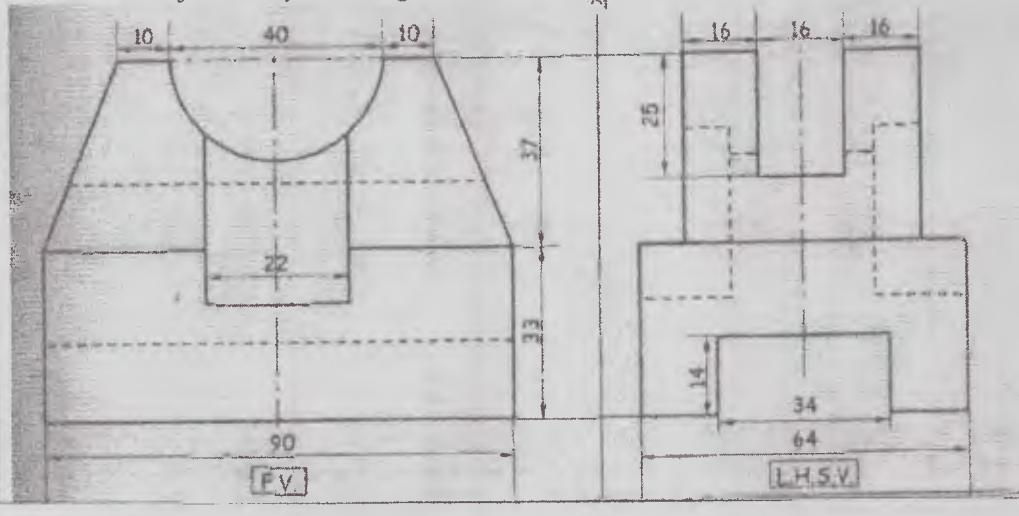
Exam Seat No.	
System No.	
Invigilator Signature	

Instructions:

- Attempt any **FIVE** questions
- Assume suitable data wherever necessary and justify the same
- Answers to all questions should be grouped together
- Save the drawings frequently in the folder and ensure that drawings are uploaded on the server infront of students after exam

Q.No.	Questions	Points	CO	BL	PI
Q1 (a)	Inscribe a parabola in the parallelogram of sides 110 mm and 70 mm long with longer side of it as the normal base. Consider one of the included angles between the sides as 60^0.	10	CO1	L3	1.3.1
Q1 (b)	The major axis of an ellipse is 120 mm long and the foci are at a distance of 20 mm from its ends. Draw the ellipse using one half of it by concentric circle method and the other half by rectangle method.	10	CO1	L3	1.3.1
Q2 (a)	A 70 mm long line PQ has its end P 20 mm above the H.P. and 40 mm infront of the V.P. The other ends Q is 60 mm above the H.P. and 10 mm infront of the V.P. Draw the projections of PQ and determine its inclinations with the reference plane.	10	CO1	L3	1.3.1
Q2 (b)	The TV of 75 mm long line PQ measures 50 mm. The end P is 15 mm above the HP and 50 mm infront of VP. The end Q is 20 mm infront of the VP and above the HP. Draw the projections of PQ and determine its inclinations with the reference planes.	10	CO1	L3	1.3.1
Q3 (a)	A thin square plate EFGH of 40 mm sides is having its corner G on HP. Diagonal GE is inclined at 40^0 to HP and diagonal FH inclined at 40^0 to VP and parallel to HP. Draw its projections.	10	CO1	L3	1.3.1
Q3 (b)	A hexagonal lamina of 24 mm side has its surface inclined at 30^0 to HP. Its one side is parallel to HP and inclined at 45^0 to VP. Draw its projections.	10	CO1	L4	1.3.1
Q4 (a)	A cylinder of base diameter 50 mm and axis 65 mm rest on a point of its base circle on the HP. Draw its projections when the axis is inclined at 30^0 to the HP and TV of the axis is perpendicular to the VP.	10	CO1	L4	1.3.1
Q4 (b)	A hexagonal pyramid of base side 30 mm and axis 60 mm, has an edge of its base on the ground inclined at 45^0 to the VP and the axis is inclined at 30^0 to the HP. Draw its projections.	10	CO1	L3	1.3.1

Q5	Figure shows the pictorial view of an object. Using first angle method of projection to draw: a) FV in the direction of X b) TV c) SV  FIG. 8.18 (a)	20	CO4	L4	1.3.1
Q6	Draw the isometric view of the following object using natural scale   	20	CO4	L6	1.3.1

Q7	F.V. and L.H.S.V. of an object are as shown in Figure, Draw the missing view of an object by using first angle method of projection.  	20	CO2	L6	1.3.1

(L)

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SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)

Munshi Nagar, Andheri (W) Mumbai – 400058

ReExaminations – January 2020

SET-A

Program:Electrical Engineering | Duration: 03 hour

Course Code: ES-BT103 | Maximum Points:100 marks

Course Name:Engineering Graphics-I | Semester:**I**

Notes: 1. Question number 01 is compulsory.
2. Solve any four questions out of remaining four main questions.
2. Draw neat schematic diagrams wherever is necessary, **highlight** important points.
3. Assume suitable data if necessary and mention it.
4. **Use <u>first angle</u> method of projection only**.

Exam Seat No	
Reg.NO.	
Machine NO.	
Sign of Invigilator	

Q. No.	Questions	Marks	CO	BL	PI
Q1 A	A pentagonal pyramid 35 mm base edge and 70 mm height is resting on H.P. with one of its triangular surface perpendicular to H.P. and parallel and nearer to V.P. draw its projections.	10	2	2	1.3 .1
Q1 B	Draw an isometric view of the following using natural scale.	10	1 , 2	2	1.3 .1

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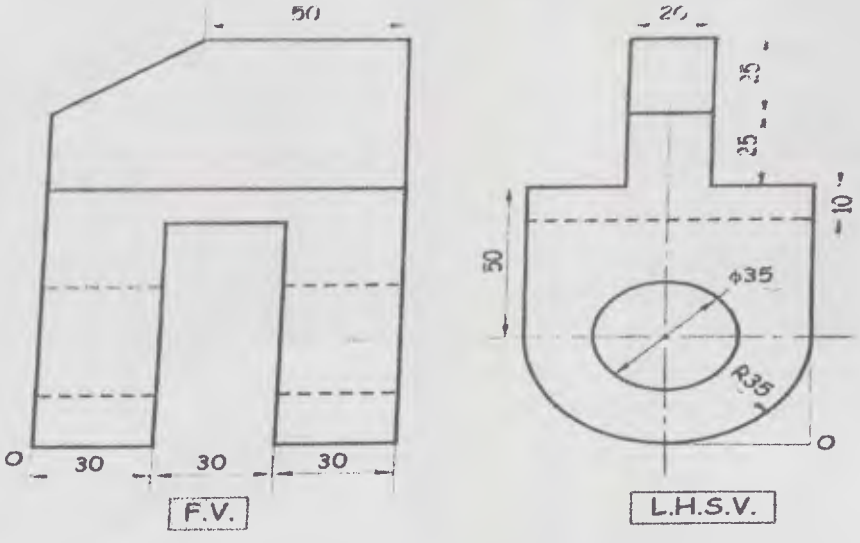
SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)

Munshi Nagar, Andheri (W) Mumbai – 400058

ReExaminations – January 2020

					
Q2 A	A line AB 90 mm long has its one end A in the H.P and 35 mm behind the V.P. and other end B in the V.P. and 55 mm below the H.P. draw the projections of line and find its inclination with the H.P. and the V.P.	10	1, 2	2	1.3.1
Q2 B	A hexagonal lamina of side 30 mm is resting in the H.P. on one of its corner. The diagonal through that corner makes an angle 45^0 with H.P. and plan of that diagonal makes an angle 60^0 with the V.P. draw the projection of plane.	10	1, 2	2	1.3.1
Q3 A	A line AB , 100 mm long is inclined at an angle of 30^0 to H.P. and 45^0 to V.P. its end point A is 10 mm above H.P.and 20 mm infront of V.P. draw the projections when point B is in the fourth quadrant. also locate its traces.	10	1, 3	2	1.3.1
Q3 B	A pentagonal plate of 30 mm side has one of its side in the V.P. and inclined at 30^0 to the H.P. the corner opposite to this side contained by the H.P. is 20 mm in front of the V.P. draw the projections and find the inclination of as surface with the V.P.	10	2, 3	2	1.3.1
Q4 A	Construct a curve generated by a circle of diameter 50 mm , when it rolls over an another circle of diameter 150mm. name the curve. draw the tangent and normal at any point on the curve.	10	1	2	1.3.1
Q4 B	Draw the projections of the cone , base 50 mm diameter and axis 75 mm long, having one of its generators in the V.P. and inclined at 30^0 to the H.P. the apex is in the H.P.	10	1, 2	2	1.3.1

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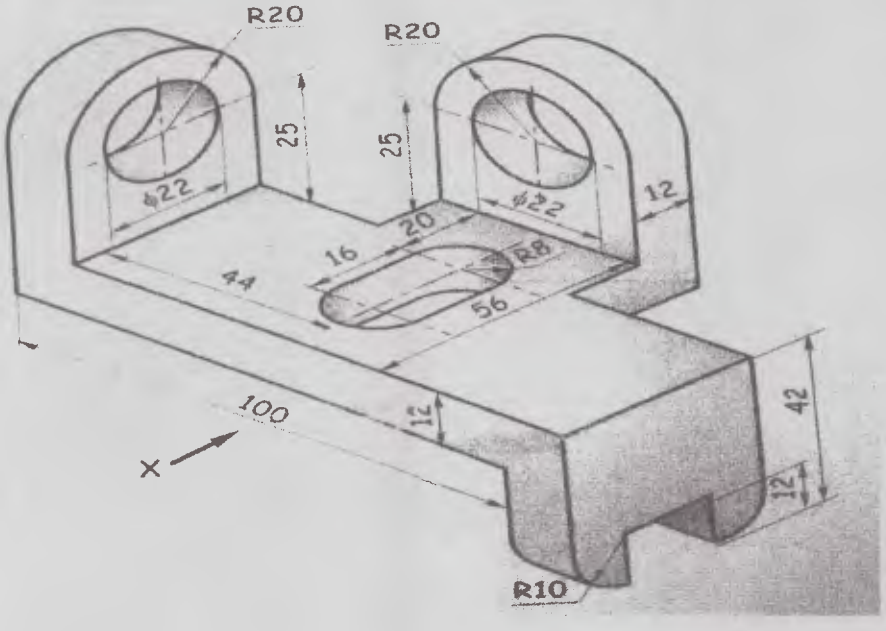
(Government Aided Autonomous Institute)

Munshi Nagar, Andheri (W) Mumbai – 400058

ReExaminations – January 2020

Q5 A	A point is moving in a plane such that the sum of its distances from fixed points is always constant and is equal to 110 mm and the focal length is 80 mm. Draw an ellipse by the arcs of circle method.	10	1, 2	2	1.3.1
Q5 B	The distance between the end projectors of a line AB is 35 mm. The line AB is 70 mm long and is inclined at 30^0 to the H.P. The end point A is 10 mm above the H.P. and 20 mm in front of the V.P. Draw the projection of line AB.	10	1	2	1.3.1
Q6 A	Draw the following orthographic projection view of figure 1}FRONT VIEW 2} TOP VIEW 3} RHSV  	20	1, 2, 3	2	1.3.1
Q7 A	The top view of a 75mm long line PQ measures 50 mm. P is 50 mm in front of the V.P. and 15mm below the H.P. Q is 15mm infront of the V.P. and is above the H.P.draw the front view of PQ and find its inclination with the H.P. and the V.P. also locate its Traces.	10	3	2	3.2.3
Q7 B	Draw an isometric view of the following using natural scale.	10	3	2	1.3.2

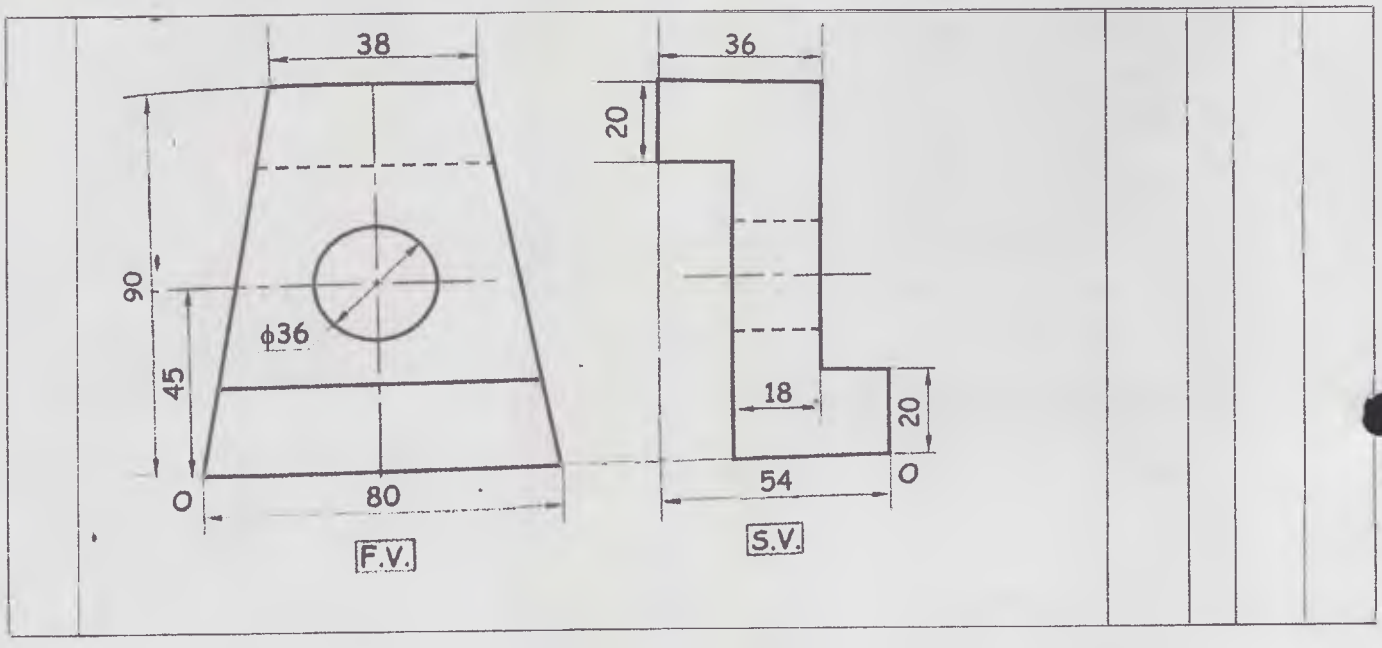
Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)

Munshi Nagar, Andheri (W) Mumbai – 400058

ReExaminations – January 2020



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Bharatiya Vidya Bhavan's
SARDAR PATEL COLLEGE OF ENGINEERING
(An Autonomous Institution Affiliated to University of Mumbai)

Re Examination for F.Y.B Tech (Civil/Mechanical/Electrical)
Batch: 2019-20

Total Marks: **100**
Duration: **3 Hrs**

CLASS/SEM : **F.Y.B Tech (C/M/E) Sem.-I**
COURSE NAME : **APPLIED PHYSICS-I**
COURSE CODE: **BSBT105**

- **Question No 1 is compulsory.**
- **Answer any FOUR out of remaining SIX questions.**
- **Marks are given against the questions.**
- **Diagrams have to be drawn wherever necessary.**
- **Assume suitable data (if necessary) and state your assumption/s clearly.**
- **Marks will be given on the basis of what will be written in the paper irrespective of your intentions!**

Good luck!

		Module	CO	BL	PI
Q1.	**(4 marks) for a to e**				
a.	Explain photoelectric effect in short.	1	1	1	1.2.1
b.	The uncertainty in the location of a particle is equal to its de Broglie wavelength. Calculate the uncertainty in momentum	2	1	2	1.1.1 1.2.1
c.	Compute the energies of lowest three energy states for an electron in a square well of width 3A°.	3	2	1	1.1.1 1.2.1
d.	Derive an expression for interplanar spacing in crystal structures.	4	3	1	1.1.1 1.2.1
e.	Find resistivity of intrinsic germanium at 300K. Given that density of carriers is $2.5x10^{19}/m^3$, mobility of electrons is $0.398m^2/V\text{-}s$ and mobility of holes is $0.19m^2/V\text{-}s$.	5	4	1	1.2.1
Q2.					
a.	**(8 marks)** Derive Bragg's equation for X ray diffraction and hence describe how Bragg's spectrometer is used to determine the type of crystal structure used.	1,4	1	1	1.1.1 1.2.1
b.	**(8 marks)**Explain Heisenberg's uncertainty principle of position and momentum. An electron is confined to a box of length 10^{-9}m. Calculate the minimum uncertainty in its velocity.	2	1	2	1.1.1 1.2.1
c.	**(4 marks)** Calculate planar atomic density of (111) in SC structure. Given that the lattice constant is 3 A°.	4	3	1	1.1.1 1.2.1
Q3.					
a.	**(8 marks)** Explain deBroglie's hypothesis and hence derive an expression for de Broglie wavelength.	2	1	1	1.1.1
b.	**(8 marks)** Arrive at Schrodinger's one dimensional time independent equation from its time dependent form.	3	2	1	1.1.1

c.	**(4 marks** Calculate the current produced in a small germanium plate of area 1cm^2 and of thickness 0.3mm, when a potential difference of 2V is applied across the faces. Given concentration of free electrons in germanium is 2x10^{19}/m^3. The mobility of electrons is 0.36m^2/V-s and of holes is 0.17m^2/V-s.	5	4	3	1.1.1 1.2.1
Q4.					
a.	**(8 marks)** Using Shrödinger's equation, obtain for a particle in a box, its Eigen functions and Eigen values. Sketch the quantized wavefunctions and probability of finding the particle inside the potential well.	3	2	2	1.1.1 1.2.1
b.	**(8 marks**) Explain using unit cell properties, HCP structure in detail. Also derive the c/a ratio for the same.	4	3	1	1.1.1
c.	**4 marks)** X-rays of wavelength 10.0 pm are scattered from a target. Find: (a) The wavelength of the X-rays scattered through an angle 45°. (b) Maximum wavelength present in the scattered X-rays (c) Maximum kinetic energy of the recoil electrons.	1	1	2	1.1.1 1.2.1
Q5.					
a.	**(8 marks)** Sketch the important plane orientations in FCC structure and hence mention their interplanar spacing ratios and planar atomic densities.	4	3	2	1.1.1 1.2.1
b.	**(8 marks)** Explain Hall Effect and hence obtain relation for Hall voltage and Hall coefficient in terms of current and magnetic field.	5	4	2	1.1.1 1.2.1
c.	**(4 marks)** An electron is bound by a potential which closely approaches an infinite square well potential of width 2.5x10^{-10}m. Calculate the lowest three permissible quantum energies that the electron can have.	2	1	1	1.2.1
Q6.					
a.	**(8 marks)** Explain Fermi level with variation of doping in a P-type semiconductor.	5	4	3	1.1.1 1.2.1
b.	**(8 marks)** Explain Compton scattering and hence derive an expression for maximum wavelength of scattered photons.	1	1	1	1.1.1 1.2.1
c.	**(4 marks)** Find the least energy of an electron moving in a one dimension in an infinitely high potential box of width 1A.	3	2	2	1.2.1
Q7.					
a.	**(8 marks)** Give an expression for Fermi function and hence define Fermi energy level also plot Fermi distribution curve.	5	4	2	1.1.1
b.	**(8 marks)**Explain concept of a wavegroup and hence derive an expression for wave velocity and phase velocity. An electron and a 150 gm baseball are traveling at 220 m/s measured to an accuracy of 0.065%. Calculate the uncertainty in position of each of the bodies. Compare the two values and comment.	2	1	2	1.1.1 1.2.1
c.	**(4 marks)** X rays are incident on (111) planes of a simple cubic crystal with a lattice constant of 0.2nm. The first order reflection is observed at a Bragg angle of 43.5°. Calculate the wavelength of X rays.	4,1	1	1	1.1.1 1.2.1

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Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai – 400058.

End-Sem-I ~~KT Exam~~ Re-exam.
Jan 2020

Max. Marks: **100 marks** Duration: **180 Min**
Class: F.Y B.TECH **C/M/E** Semester: **I** Program:
Name of the Course: **Applied Chemistry –I** Course Code :BS- BT-106

Instructions:

1 Question **No** (Q6) is compulsory
2 Attempt any 4 from Q1 Q2Q3 Q4 Q5

Que. No	Question	Points	CO	BL	PI
Q1					
a	Explain EDTA method for detection of hardness	5	1	2	2.2.3
b	What is temporary hardness and permanent hardness	5	1	1	1.2.1
c	Explain lime Zeolite process with chemical reactions. Write advantages its of Zeolite process	10	1	2	2.2.3
Q2					
a	Write short note on acid value of lubricant with significance	5	4	1	1.2.1
b	Define lubricant. Explain viscosity and viscosity index with significance	5	4	1	1.3.1
c	Classify different types of lubricant	10	4	2	2.2.4
Q3					
a	Explain COD method for detection of organic matter content with chemical reaction	5	3	2	2.2.3
b	Write short note on TDS and its importance	5	3	1	~~1.2.1~~
c	Describe ion-exchange method for removal of metal cation ions from hard water with advantages and disadvantages	10	3	2	2.2.4
Q4					
a	Explain Reverse osmosis and ultra-filtration with its advantages over all method	5	1	2	2.2.3
b	Write difference between BOD and COD	5	1		1.2.1
c	Explain testing of Lubricant. write chemical testing of lubricant with its significance	10	4	2	2.2.3

Q5					
a	Write short note on carbon Nano tube	**5**	5	1	1.2.1
b	Explain applications of nanomaterials in different field	**5**	5	2	2.2.3
c	Explain the properties affected with Nano-size	**10**	5	2	2.2.3
Q6					
a	Convert the unit 20 PPM in to ^{0}Fr, ^{0}Cl, mg/L 10 ^{0}Cl in to ^{0}Fr , ppm, mg/L	**5**	1	2	2.1.3
b	Calculate the temporary , permanent and total hardness for water sample contain $Mg(HCO_3)_2$=10mg/L, $CaSO_4$= 10mg/L $CaCl_2$=10mg/L	**5**	1	3	3.2.1
c	25mL standard hard water containing 1.2 mg/mL CaCO3 consumed 50 mL of EDTA. 25mL of unknown hard water sample consumed 25 ml of EDTA using EBT as indicator. After boiling, filtration of same hard water(25 mL) consumed 10 mL of EDTA using EBT as indicator Calculate total, permanent and temporary hardness of water	**5**	1	3	3.2.1
d	A 100ml of a sewage water sample was reflexed with 10 ml of 0.25N K2Cr2O7in presence of dilute H_2SO_4 And Hg_2SO4. The Unreacted dichromate required 6.0 mL of 0.1N Ferrous Ammonium sulphate solution.10ml of $K2Cr_2O_7$ and 50ml of distilled water under same condition as the sample required 26.5 ml of 0.1N ferrous ammonium sulphate solution. Calculate the COD of Sample	**5**	1	3	3.2.1

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End-Sem-I ~~KT Exam~~ Re-exam .

Jan 2020

Max. Marks: **100 marks** Duration: **180 Min**
Class: F.Y B.TECH **C/M/E** Semester: **I** Program:
Name of the Course: **Applied Chemistry –I** Course Code :BS- BT-106

Instructions:

1 Question **No** (Q6) is compulsory
2 Attempt any 4 from Q1 Q2Q3 Q4 Q5

Que. No	Question	Points	CO	BL	PI
Q1					
a	Explain EDTA method for detection of hardness	**5**	1	2	2.2.3
b	What is temporary hardness and permanent hardness	**5**	1	1	1.2.1
c	Explain lime Zeolite process with chemical reactions. Write advantages its of Zeolite process	**10**	1	2	2.2.3
Q2					
a	Write short note on acid value of lubricant with significance	**5**	4	1	1.2.1
b	Define lubricant. Explain viscosity and viscosity index with significance	**5**	4	1	1.3.1
c	Classify different types of lubricant	**10**	4	2	2.2.4
Q3					
a	Explain COD method for detection of organic matter content with chemical reaction	**5**	3	2	2.2.3
b	Write short note on TDS and its importance	**5**	3	1	1.2.1
c	Describe ion-exchange method for removal of metal cation ions from hard water with advantages and disadvantages	**10**	3	2	2.2.4
Q4					
a	Explain Reverse osmosis and ultra-filtration with its advantages over all method	**5**	1	2	2.2.3
b	Write difference between BOD and COD	**5**	1		1.2.1
c	Explain testing of Lubricant. write chemical testing of lubricant with its significance	**10**	4	2	2.2.3

Q5					
a	Write short note on carbon Nano tube	**5**	5	1	1.2.1
b	Explain applications of nanomaterials in different field	**5**	5	2	2.2.3
c	Explain the properties affected with Nano-size	**10**	5	2	2.2.3
Q6					
a	Convert the unit 20 PPM in to ^{0}Fr, ^{0}Cl, mg/L 10 ^{0}Cl in to ^{0}Fr , ppm, mg/L	**5**	1	2	2.1.3
b	Calculate the temporary , permanent and total hardness for water sample contain $Mg(HCO_3)_2$=10mg/L, $CaSO_4$= 10mg/L $CaCl_2$=10mg/L	**5**	1	3	3.2.1
c	25mL standard hard water containing 1.2 mg/mL CaCO3 consumed 50 mL of EDTA. 25mL of unknown hard water sample consumed 25 ml of EDTA using EBT as indicator. After boiling, filtration of same hard water(25 mL) consumed 10 mL of EDTA using EBT as indicator Calculate total, permanent and temporary hardness of water	**5**	1	3	3.2.1
d	A 100ml of a sewage water sample was reflexed with 10 ml of 0.25N K2Cr2O7in presence of dilute H_2SO_4 And Hg_2SO4. The Unreacted dichromate required 6.0 mL of 0.1N Ferrous Ammonium sulphate solution.10ml of $K2Cr_2O_7$ and 50ml of distilled water under same condition as the sample required 26.5 ml of 0.1N ferrous ammonium sulphate solution. Calculate the COD of Sample	**5**	1	3	3.2.1

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End-Sem-I ~~KT-Exam~~ Re-exam
JAN. 2019

Max. Marks: **75 marks** Duration: **180 Min**
Class: F.Y B.TECH **C/M/E** Semester: **I** Program:
Name of the Course: **Applied Chemistry –I** Course Code : BT-106

Instructions:

1 Question **No** (Q5) is compulsory
2 Attempt any 3 from Q1 Q2Q3 Q4

Que. No	Question	Points	CO	BL	PI
Q1					
a	Explain EDTA method for detection of hardness	**5**	1	2	2.2.3
b	What is temporary hardness and permanent hardness	**5**	1	1	1.2.1
c	Explain lime Zeolite process with chemical reactions. Write advantages its of Zeolite process	**10**	1	2	2.2.3
Q2					
a	Write short note on acid value of lubricant with significance	**5**	4	1	1.2.1
b	Define lubricant. Explain viscosity and viscosity index with significance	**5**	4	1	1.3.1
c	Classify different types of lubricant	**10**	4	2	2.2.4
Q3					
a	Explain COD method for detection of organic matter content with chemical reaction	**5**	3	2	2.2.3
b	Write short note on TDS and its importance	**5**	3	1	1.2.1
c	Describe ion-exchange method for removal of metal cation ions from hard water with advantages and disadvantages	**10**	3	2	2.2.4
Q4					
a	Write short note on carbon Nano tube	**5**	5	1	1.2.1
b	Explain applications of nanomaterials in different field	**5**	5	2	2.2.3
c	Explain the properties affected with Nano-size	**10**	5	2	2.2.3

Q5					
a	Convert the unit 20 PPM in to ^{0}Fr, ^{0}Cl, mg/L 10 ^{0}Cl in to ^{0}Fr , ppm, mg/L	5	1	2	2.1.3
b	Calculate the temporary , permanent and total hardness for water sample contain $Mg(HCO_3)_2$=10mg/L, $CaSO_4$= 10mg/L $CaCl_2$=10mg/L	5	1	3	3.2.1
c	25mL standard hard water containing 1.2 mg/mL CaCO3 consumed 50 mL of EDTA. 25mL of unknown hard water sample consumed 25 ml of EDTA using EBT as indicator. After boiling, filtration of same hard water(25 mL) consumed 10 mL of EDTA using EBT as indicator Calculate total, permanent and temporary hardness of water	5	1	3	3.2.1

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Re- examination (OLD)

ODD SEM January 2020

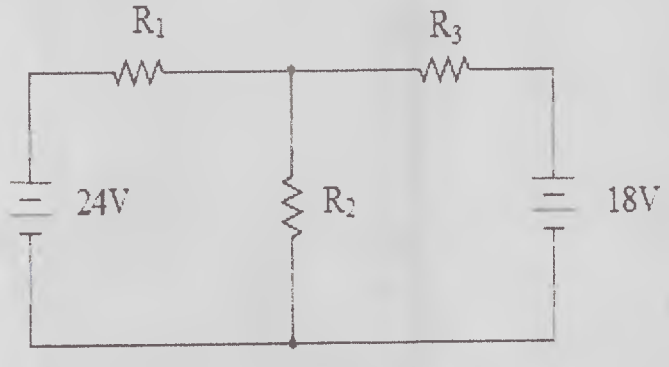
Program: C/M/E Engineering
Course code: ~~ES~~-BT102
Name of the Course: Basic Electrical ~~Engineering~~ Electronics I

Duration: 3 Hour
Maximum Marks: 100
Semester: I

Notes: 1) Solve any five questions.

2) Assume suitable data if necessary and state the assumption clearly.

3) Answers to all sub questions should be grouped together.

Q. No.	Questions	Pts	CO	BL
1	a) Explain any one method of starting a single phase AC motor in detail.	(05)	03	2
	b) Explain working principle of a transformer.	(05)	03	2
	c) List any five components of a DC machine and write any one use of these.	(05)	03	2
	d) Why three phase induction motor is self-starting? Explain in detail.	(05)	03	3
2	a) Use Superposition theorem to determine current through R1, R2 and R3. Given R1 = 10 Ω, R2 = 80 and R3 = 40 Ω. Verify the result with nodal and mesh analysis. 	(10)	01	3

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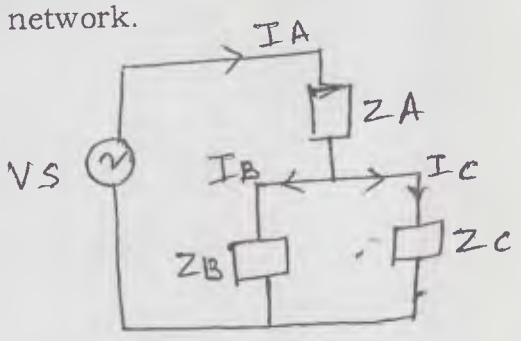
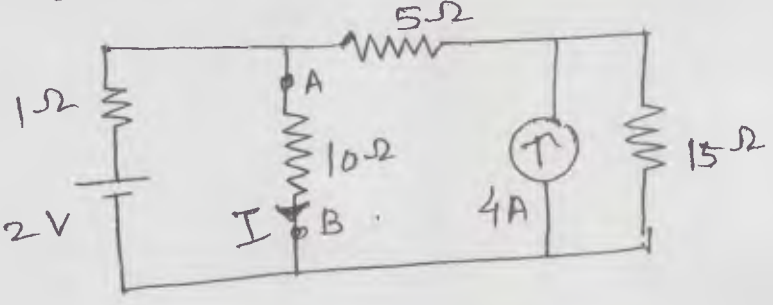
Re- examination (OLD)

ODD SEM January 2020

	b) In the circuits shown below $Z_A = 10 + j8$, $Z_B = 9 - j6$ and $Z_C = 3 + j2$. If voltage Vs = 50 $\angle 0^0$ determine currents I_A, I_B and I_C. Determine equivalent impedance and admittance of the network. Also determine power factor of the network. 	(10)	02	3
3	a) A series RLC circuit has a current which lags the applied voltage by 45^0. The voltage across the inductor has maximum value equal to twice maximum value of voltage across capacitor. The voltage across inductor is 300 sin(wt) and R= 20 ohm. Find the value of inductance and capacitance if supply frequency is 50 Hz.	(10)	02	3
	b) Using Thevenin's equivalent circuit determine current I through 10 ohm. 	(10)	02	2
4	a) A balanced 3 phase star connected load consists of a resistance in series with capacitance in each phase. The supply is 416 V, 3-phase, 50 Hz. Readings of the two wattmeters connected to measure power is 780 watt and 1980 watt. Calculate power factor, line current, resistance and capacitance of each phase.	(10)	02	3
	b) Find real, reactive and apparent power for each branch and calculate overall power factor of the circuit. Draw current phasors.	(10)	02	3

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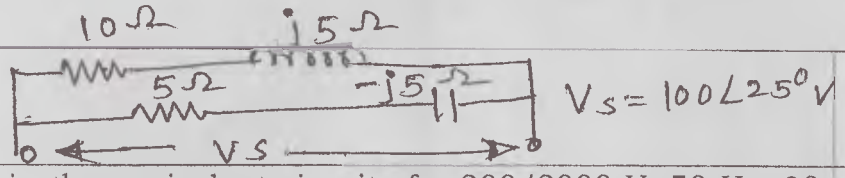
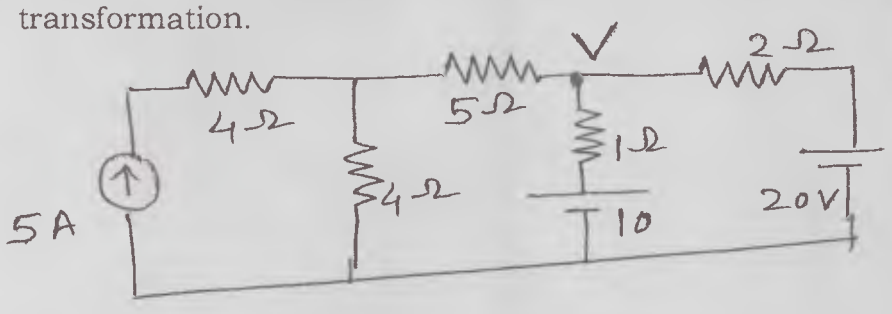
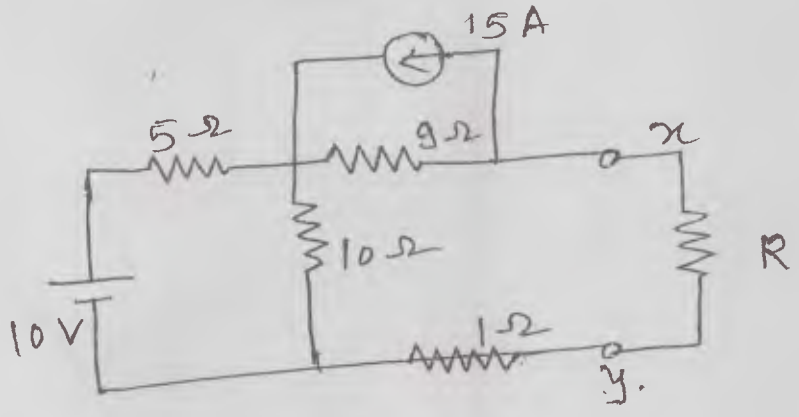
Re- examination (OLD)

ODD SEM January 2020



5	a) Obtain the equivalent circuit of a 200/2000 V, 50 Hz, 30 KVA single phase transformer from following test data: a. O.C. test: 200 V, 6.2 A, 360 W (on LV side) b. S.C. test: 75 V, 15 A, 600 W (on HV side)	(10)	03	4
	b) A 50 KVA single phase transformer of 2300 / 230 V has primary and secondary winding resistances of 2 ohm and 0.02 ohm respectively. The core loss is 412 Watt. Calculate efficiency at i) half load with 0.8 lagging pf (ii) full load with 0.8 leading pf.	(10)	03	3
6	a) Determine V in following circuit using source transformation. 	(10)	01	2
	b) Determine R for maximum power transfer. Also find maximum power. 	(10)	02	2

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Munshi Nagar, Andheri (W) Mumbai – 400058

Re-Exam January 2019 Examinations

Program: F.E.(Mechanical)

Course Code: ~~EEC003~~ ES-BT103

Course Name: Engineering Graphics -1

Duration: 3hr

Maximum Points: 100

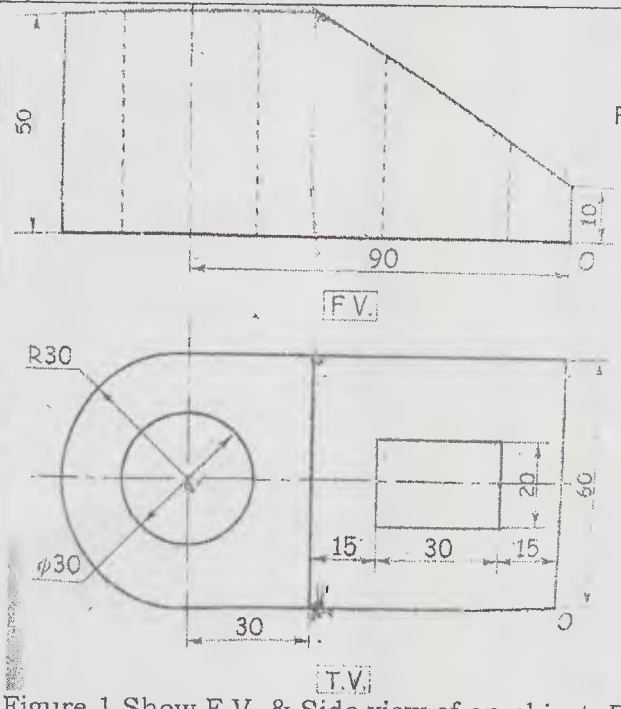
Semester: I

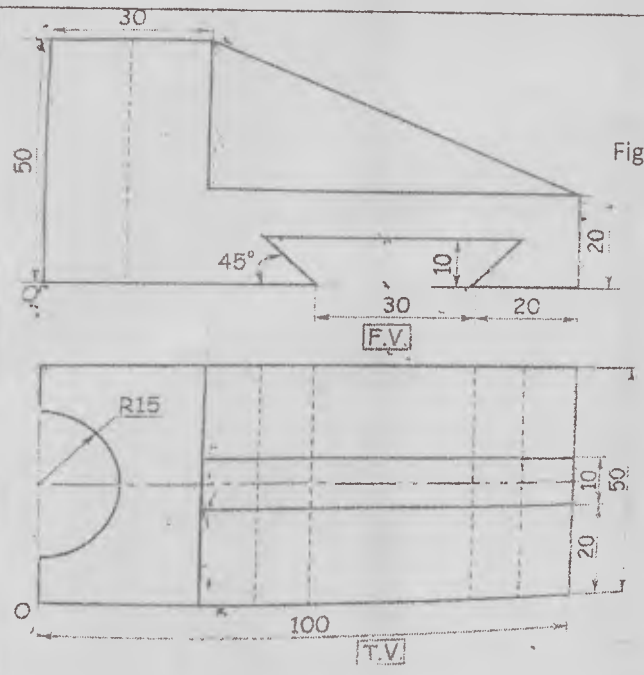
Exam Seat no.:

PC no. of student :

- Use only First Angle method of projection
- Figures to the right indicate full points
- Assume suitable data, wherever necessary.
- Students are required to save the drawings in the Folder assigned to them during examination, before leaving the examination room.
- Student will be responsible, if he fails to save the drawings of AUTOCAD in the Folder assigned to them during examination

Q.No.	Questions	Points	CO	BL	PI
Q.1 (A)	The end of a straight line AB 90 mm long, is in the second quadrant & 15 mm from both the H.P. & V.P. End B is in IIIrd quadrant. The line is inclined at 30 degree with the H.P. and the distance between the end projectors measured parallel to the XY line is 60 mm. Draw the projections of line. Find its inclination with V.P. Also locate the traces.	10	1,2,3	2	5.2.2
B	The F.V. of 85 mm long straight line AB measures 60 mm while its T.V. measures 70 mm. draw the projections of AB, if its end A is 10 mm above H.P.& 20 mm behind V.P., while its end B is in the first quadrant. Determine the inclination of the line AB with reference plane. Also locate the traces	10	1,2,3	2	5.2.2
Q.2 (A)	A rectangular plane ABCD with side BC =50 mm and AB = 30 mm has its surface inclined at an angle of 30 degree to the V.P. One of the shorter edge say (AB) is in the V.P. and makes an angle 45 degree with H.P. Draw its projections	10	1,2,3	2	5.2.2
B	A square lamina ABCD of 50 mm side rest on the corner A in the H.P. such that the plane is seen as a rhombus in the top view with diagonal contained by corner A measuring 25 mm. Another diagonal is inclined at 45 degree to V.P. & parallel to H.P. Draw its projections & determine surface inclination of the plane with the H.P.	10	1,2,3	2	5.2.2

Q.3 (A)	A Square pyramid side of base 40 mm, axis length 60 mm has one of the side of base in the H.P. The axis of a solid is inclined to the H.P. and the V.P. at an angle of 30 degree & 45 degree respectively. Draw its projections	10	1,2,3	2	5.2.2
B	A Pentagonal Prism having an edge of base 25 mm, axis height 60 mm has one of its corner in the H.P. The axis is inclined at 30 degree to H.P. and the T.V. of the axis is inclined at 45 degree to the V.P. draw the projections.	10	1,2,3	2	5.2.2
Q.4 (A)	The distance of a locus from the directrix is 50mm. A point moves in such a way that the eccentricity is equal to 3/2. Draw the locus of the point and name the curve.	10	1,2,3	2	5.2.2
B	Draw a helix on the cylinder of 60 mm diameter & height 50 mm on & also develop the surface of the cylinder	10	1,2,3	2	5.2.2
Q.5 (A)	 Figure-1 Figure 1 Show F.V. & Side view of an object. Draw the isometric view using 'O' as the Origin	10	4	2	5.2.2

B	 Figure-2 Figure 2 Show F.V. & Side view of an object. Draw the isometric view using 'O' as the Origin	10	4	2	5.2.2
Q.6	Figure 3 Show two views of an object. Redraw the given Front View, Top View & draw the missing LHSV view	20	4	2	5.2.2
Q.7	Figure 4 shows a Pictorial view of an object. Draw the F.V., T.V, R.H.S.V	20	4	2	5.2.2

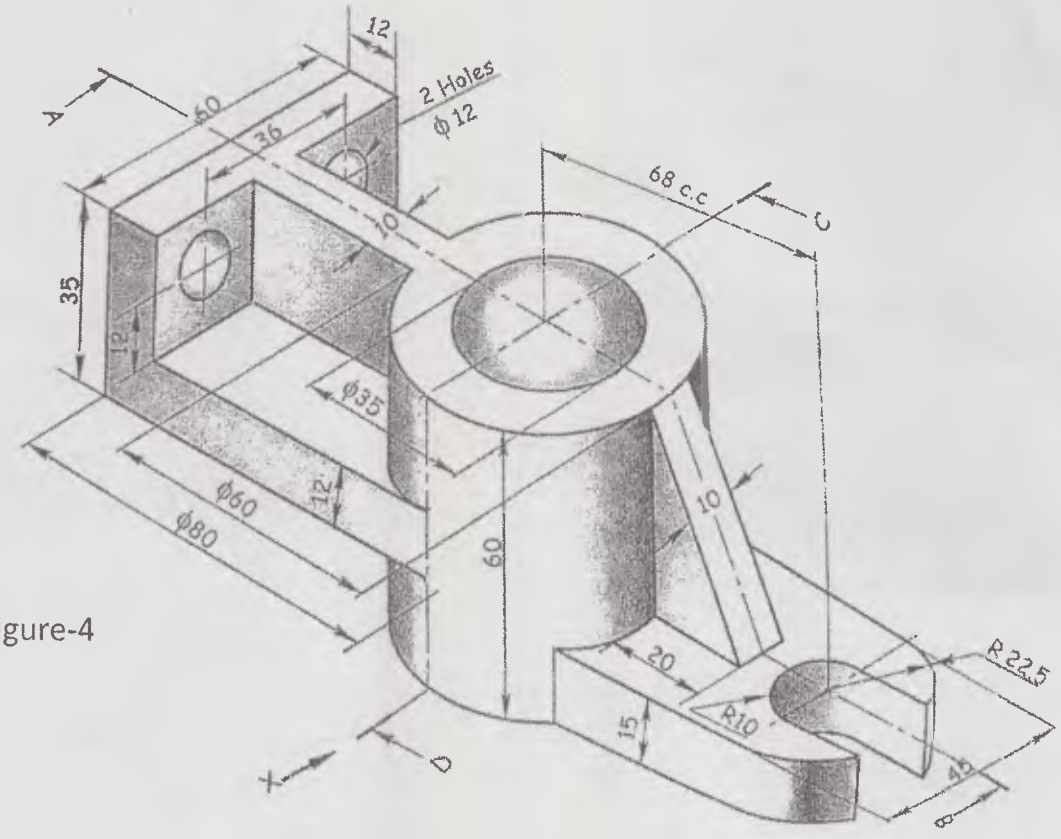


Figure-4

an
of

5)

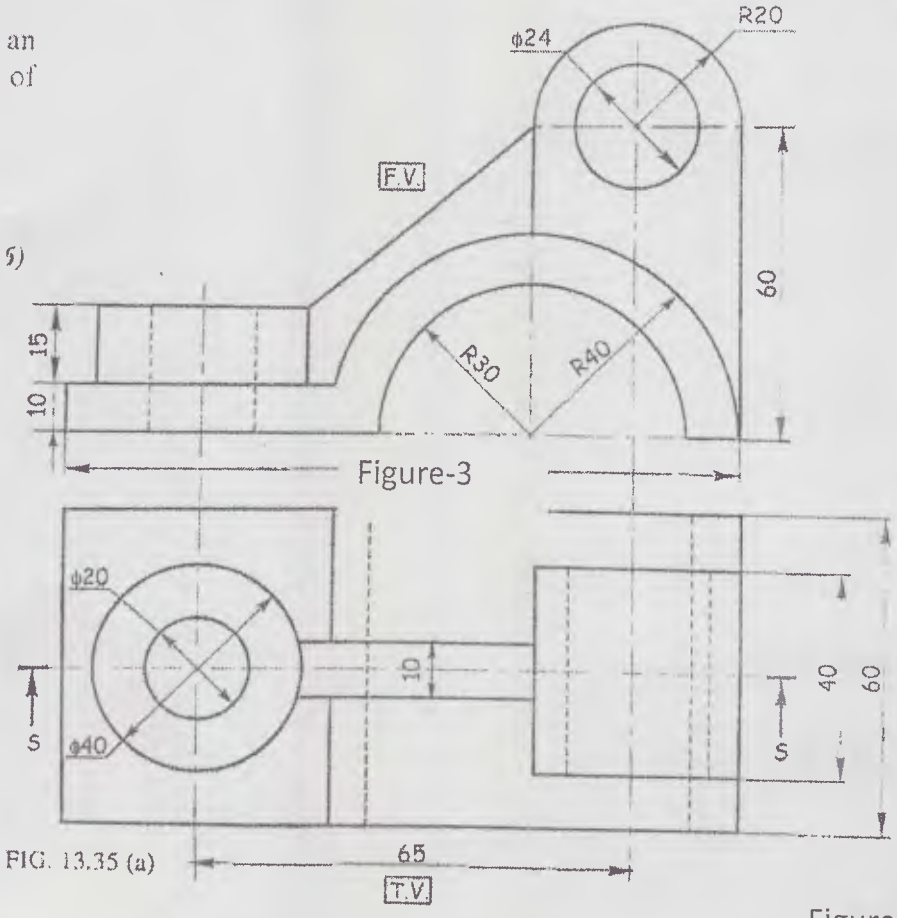


Figure-3

FIG. 13.35 (a)

Figure-3

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SARDAR PATEL COLLEGE OF ENGINEERING

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Munshi Nagar, Andheri (W) Mumbai – 400058

Re Exam January 2020

Program: F.Y. B.Tech Civil Engineering
Duration: 03 Hours

Course Code: ES-BT103
Maximum Points: 100

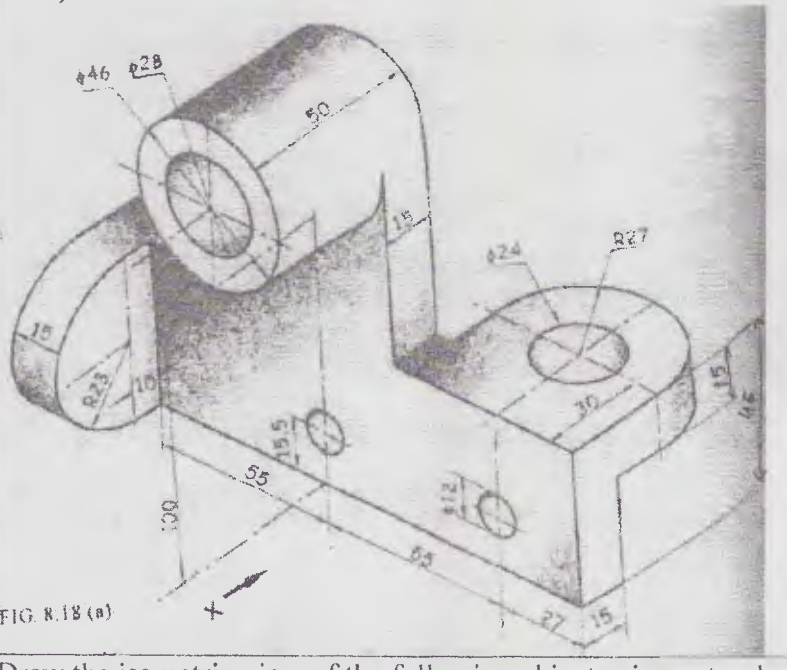
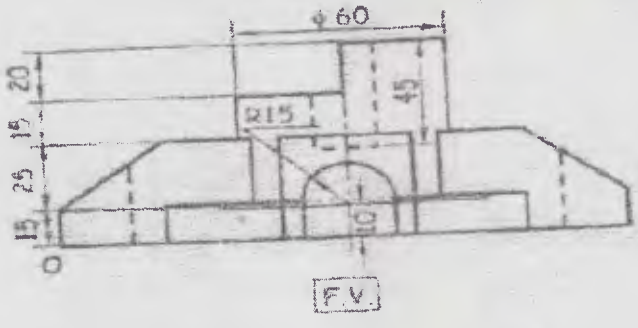
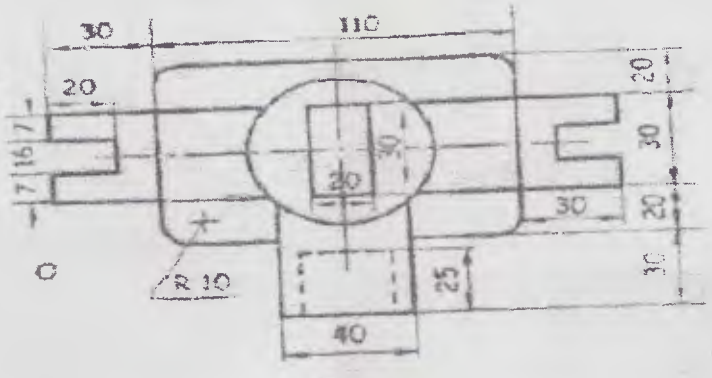
Course Name: Engineering Graphics I
Semester: I

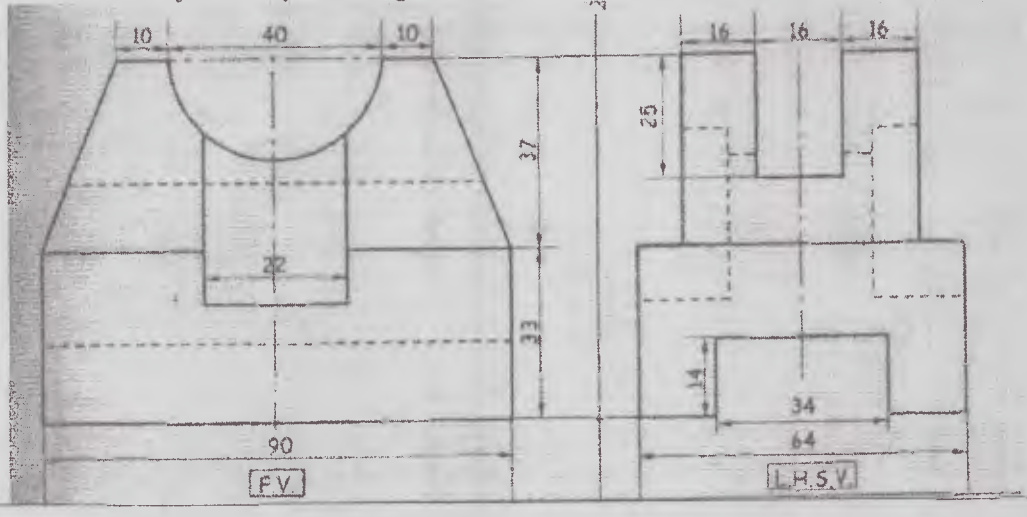
Exam Seat No.	
System No.	
Invigilator Signature	

Instructions:

- Attempt any **FIVE** questions
- Assume suitable data wherever necessary and justify the same
- Answers to all questions should be grouped together
- Save the drawings frequently in the folder and ensure that drawings are uploaded on the server infront of students after exam

Q.No.	Questions	Points	CO	BL	PI
Q1 (a)	Inscribe a parabola in the parallelogram of sides 110 mm and 70 mm long with longer side of it as the normal base. Consider one of the included angles between the sides as 60^0.	10	CO1	L3	1.3.1
Q1 (b)	The major axis of an ellipse is 120 mm long and the foci are at a distance of 20 mm from its ends. Draw the ellipse using one half of it by concentric circle method and the other half by rectangle method.	10	CO1	L3	1.3.1
Q2 (a)	A 70 mm long line PQ has its end P 20 mm above the H.P. and 40 mm infront of the V.P. The other ends Q is 60 mm above the H.P. and 10 mm infront of the V.P. Draw the projections of PQ and determine its inclinations with the reference plane.	10	CO1	L3	1.3.1
Q2 (b)	The TV of 75 mm long line PQ measures 50 mm. The end P is 15 mm above the HP and 50 mm infront of VP. The end Q is 20 mm infront of the VP and above the HP. Draw the projections of PQ and determine its inclinations with the reference planes.	10	CO1	L3	1.3.1
Q3 (a)	A thin square plate EFGH of 40 mm sides is having its corner G on HP. Diagonal GE is inclined at 40^0 to HP and diagonal FH inclined at 40^0 to VP and parallel to HP. Draw its projections.	10	CO1	L3	1.3.1
Q3 (b)	A hexagonal lamina of 24 mm side has its surface inclined at 30^0 to HP. Its one side is parallel to HP and inclined at 45^0 to VP. Draw its projections.	10	CO1	L4	1.3.1
Q4 (a)	A cylinder of base diameter 50 mm and axis 65 mm rest on a point of its base circle on the HP. Draw its projections when the axis is inclined at 30^0 to the HP and TV of the axis is perpendicular to the VP.	10	CO1	L4	1.3.1
Q4 (b)	A hexagonal pyramid of base side 30 mm and axis 60 mm, has an edge of its base on the ground inclined at 45^0 to the VP and the axis is inclined at 30^0 to the HP. Draw its projections.	10	CO1	L3	1.3.1

Q5	Figure shows the pictorial view of an object. Using first angle method of projection to draw: a) FV in the direction of X b) TV c) SV  FIG. R.18 (a)	20	CO4	L4	1.3.1
Q6	Draw the isometric view of the following object using natural scale   	20	CO4	L6	1.3.1

Q7	F.V. and L.H.S.V. of an object are as shown in Figure, Draw the missing view of an object by using first angle method of projection.  	20	CO2	L6	1.3.1

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SARDAR PATEL COLLEGE OF ENGINEERING

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Munshi Nagar, Andheri (W) Mumbai – 400058

ReExaminations – January 2020

SET-A

Program:Electrical Engineering | Duration: 03 hour

Course Code: ES-BT103 | Maximum Points:100 marks

Course Name:Engineering Graphics-I | Semester:**I**

Notes: 1. Question number 01 is compulsory.
2. Solve any four questions out of remaining four main questions.
2. Draw neat schematic diagrams wherever is necessary, **highlight** important points.
3. Assume suitable data if necessary and mention it.
4. **Use <u>first angle</u> method of projection only.**

Exam Seat No	
Reg.NO.	
Machine NO.	
Sign of Invigilator	

Q. No.	Questions	Marks	CO	BL	PI
Q1 A	A pentagonal pyramid 35 mm base edge and 70 mm height is resting on H.P. with one of its triangular surface perpendicular to H.P. and parallel and nearer to V.P. draw its projections.	10	2	2	1.3.1
Q1 B	Draw an isometric view of the following using natural scale.	10	1.2	2	1.3.1

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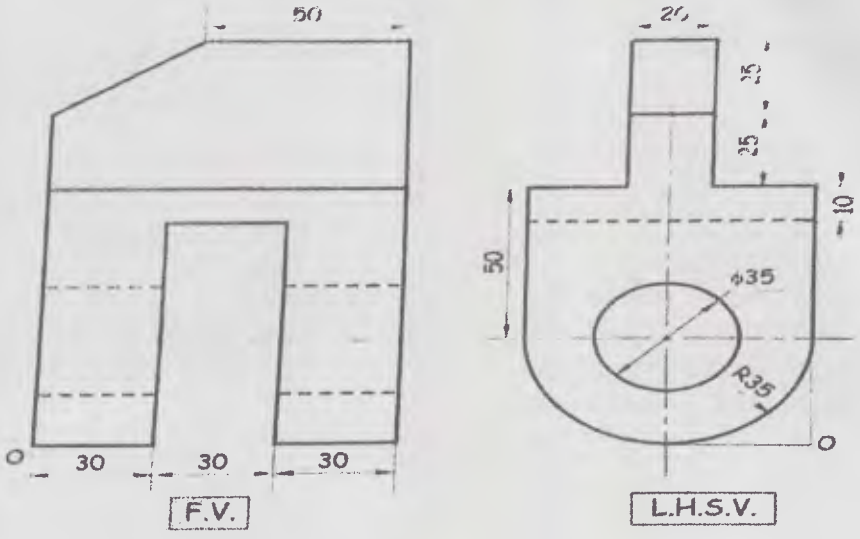
ReExaminations – January 2020

					
Q2 A	A line AB 90 mm long has its one end A in the H.P and 35 mm behind the V.P. and other end B in the V.P. and 55 mm below the H.P. draw the projections of line and find its inclination with the H.P. and the V.P.	10	1, 2	2	1.3.1
Q2 B	A hexagonal lamina of side 30 mm is resting in the H.P. on one of its corner. The diagonal through that corner makes an angle 45^0 with H.P. and plan of that diagonal makes an angle 60^0 with the V.P. draw the projection of plane.	10	1, 2	2	1.3.1
Q3 A	A line AB , 100 mm long is inclined at an angle of 30^0 to H.P. and 45^0 to V.P. its end point A is 10 mm above H.P.and 20 mm infront of V.P. draw the projections when point B is in the fourth quadrant. also locate its traces.	10	1, 3	2	1.3.1
Q3 B	A pentagonal plate of 30 mm side has one of its side in the V.P. and inclined at 30^0 to the H.P. the corner opposite to this side contained by the H.P. is 20 mm in front of the V.P. draw the projections and find the inclination of as surface with the V.P.	10	2, 3	2	1.3.1
Q4 A	Construct a curve generated by a circle of diameter 50 mm , when it rolls over an another circle of diameter 150mm. name the curve. draw the tangent and normal at any point on the curve.	10	1	2	1.3.1
Q4 B	Draw the projections of the cone , base 50 mm diameter and axis 75 mm long, having one of its generators in the V.P. and inclined at 30^0 to the H.P. the apex is in the H.P.	10	1, 2	2	1.3.1

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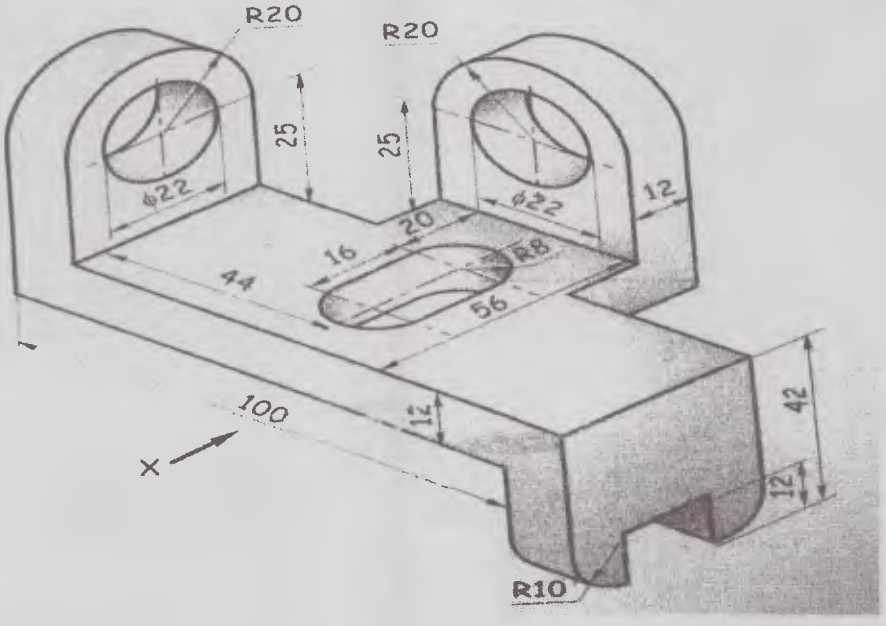
ReExaminations – January 2020

Q5 A	A point is moving in a plane such that the sum of its distances from fixed points is always constant and is equal to 110 mm and the focal length is 80 mm. Draw an ellipse by the arcs of circle method.	10	1, 2	2	1.3.1
Q5 B	The distance between the end projectors of a line AB is 35 mm. The line AB is 70 mm long and is inclined at 30^0 to the H.P. The end point A is 10 mm above the H.P. and 20 mm in front of the V.P. Draw the projection of line AB.	10	1	2	1.3.1
Q6 A	Draw the following orthographic projection view of figure 1}FRONT VIEW 2} TOP VIEW 3} RHSV  	20	1, 2, 3	2	1.3.1
Q7 A	The top view of a 75mm long line PQ measures 50 mm. P is 50 mm in front of the V.P. and 15mm below the H.P. Q is 15mm infront of the V.P. and is above the H.P.draw the front view of PQ and find its inclination with the H.P. and the V.P. also locate its Traces.	10	3	2	3.2.3
Q7 B	Draw an isometric view of the following using natural scale.	10	3	2	1.3.2

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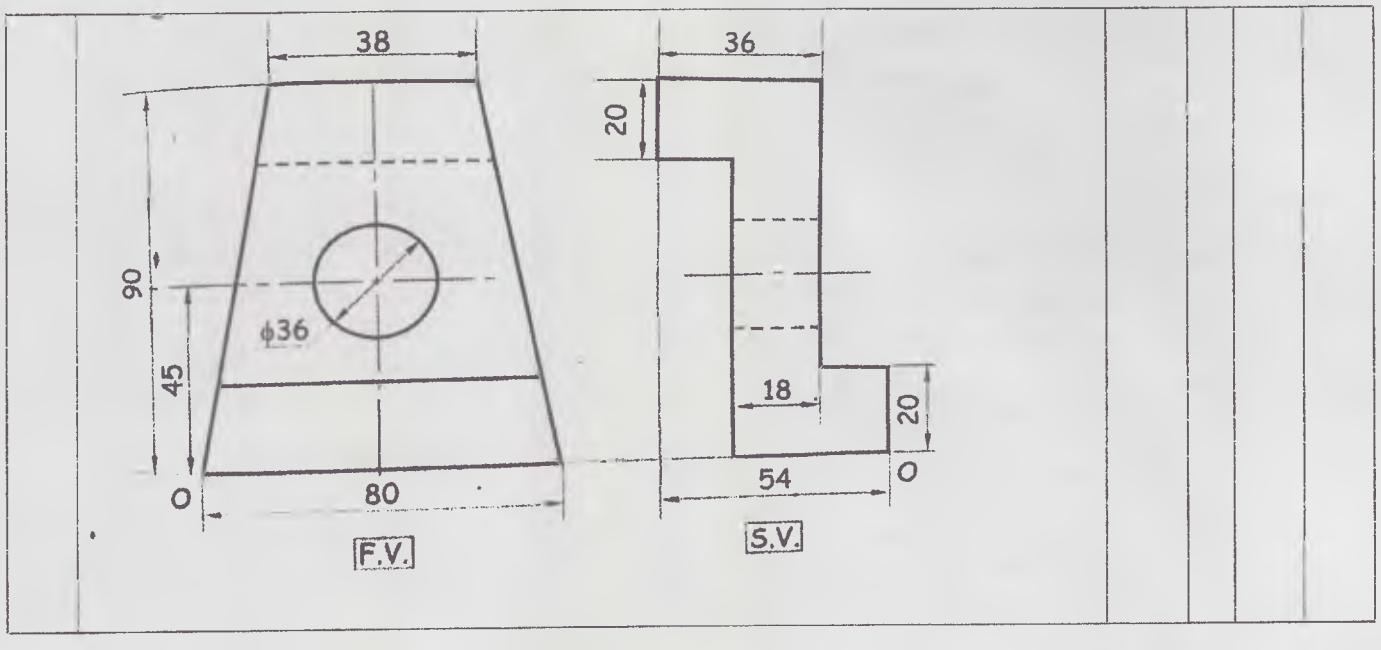

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SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)
Munshi Nagar, Andheri (W) Mumbai – 400058

Re-Examinations (OLD Course)- January 2020

Program: Civil/Mechanical/Electrical
Course Code: BT101
Course Name: Engineering Mathematics I

Duration: 3 hours
Maximum Points: 100
Semester: I

Instructions:
1. Question No 1 is compulsory.
2. Attempt any four questions out of remaining six.

Q.No.	Questions	Points
1(a)	Find the angle between the two surfaces $x^2+y^2+z^2=6$ and $z=4-y^2-xy$ at $(1,1,2)$	6
1(b)	If $\alpha=i+1,\ \beta=1-i$ & $\tan\phi=\frac{1}{x+1}$, prove that $\frac{(x+\alpha)^n-(x+\beta)^n}{\alpha-\beta}=\sin n\phi\cdot\operatorname{cosec}^n\phi$	6
1(c)	If $y=\cos\left[\log\left(x^2-2x+1\right)\right]$, prove that $(x-1)^2 y_{n+2}+(2n+1)(x-1)y_{n+1}+\left(n^2+4\right)y_n=0$	8
2(a)	Prove that $\frac{\sin 5\theta}{\sin\theta}=16\cos^4\theta-12\cos^2\theta+1$	6
2(b)	If $y=\frac{2x-1}{(x-1)^2(x+2)}$, find y_n	6
2(c)	Find the value of n so that $v=r^n\left(3\cos^2\theta-1\right)$ satisfies the equation $\frac{\partial}{\partial r}\left(r^2\frac{\partial v}{\partial r}\right)+\frac{1}{\sin\theta}\frac{\partial}{\partial\theta}\left(\sin\theta\frac{\partial v}{\partial\theta}\right)=0$	8
3(a)	Expand $x^4-3x^3+2x^2-x+1$ in positive powers of $(x-3)$	6
3(b)	If $u=\frac{e^{x+y+z}}{e^x+e^y+e^z}$, Prove that $u_x+u_y+u_z=2u$	6

3(c)	If $\cosh x = \sec\theta$, prove that (i) $x = \log(\sec\theta + \tan\theta)$ (ii) $\theta = \frac{\pi}{2} - 2\tan^{-1}(e^{-x})$ (iii) $\tanh\left(\frac{x}{2}\right) = \tan\frac{\theta}{2}$	8
4(a)	If $\sin(\alpha + i\beta) = x + iy$, Prove that (i) $\frac{x^2}{\cosh^2\beta} + \frac{y^2}{\sinh^2\beta} = 1$ (ii) $\frac{x^2}{\sin^2\alpha} - \frac{y^2}{\cos^2\alpha} = 1$	6
4(b)	If $u = f\left(\frac{y-x}{xy}, \frac{z-x}{xz}\right)$, Prove that $x^2\frac{\partial u}{\partial x} + y^2\frac{\partial u}{\partial y} + z^2\frac{\partial u}{\partial z} = 0$	6
4(c)	Find all the stationary points of the function $f(x,y) = x^3 + 3xy^2 - 15x^2 - 15y^2 + 72x$ and examine whether the function is maximum or minimum at those points.	8
5(a)	Find the unit normal vector to the surface $x^2y + 2xz = 4$ at $(2,-2,3)$	6
5(b)	Prove that $\log(1+\tan x) = x - \frac{x^2}{2} + \frac{2}{3}x^3 - \frac{7}{12}x^4 + \cdots$	6
5(c)	If $x = u+v+w$, $y = uv+vw+uw$, $z = uvw$, Prove that $x\frac{\partial\phi}{\partial x} + 2y\frac{\partial\phi}{\partial y} + 3z\frac{\partial\phi}{\partial z} = u\frac{\partial\phi}{\partial u} + v\frac{\partial\phi}{\partial v} + w\frac{\partial\phi}{\partial w}$ wher $\phi = \phi(x,y,z)$	8
6(a)	Prove that $\cos\left[i\log\left(\frac{a-ib}{a+ib}\right)\right] = \frac{a^2-b^2}{a^2+b^2}$	6
6(b)	If $u = \tan^{-1}\left(\frac{x^3+y^3}{x-y}\right)$, Prove that $x^2\frac{\partial^2 u}{\partial x^2} + 2xy\frac{\partial^2 u}{\partial x\partial y} + y^2\frac{\partial^2 u}{\partial y^2} = \sin 4u - \sin 2u$	6
6(c)	Find the Directional Derivative of $\phi = xy^2 + yz^3$ at $(1,-1,1)$ along the direction of normal to the surface $x^2 + y^2 + z^2 = 9$ at $(1,2,2)$	8

7(a)	If $u=\cos\left(\frac{xy+yz}{x^2+y^2+z^2}\right)+\sin\left(\sqrt{x}+\sqrt{y}+\sqrt{z}\right)$ Find $x\frac{\partial u}{\partial x}+y\frac{\partial u}{\partial y}+z\frac{\partial u}{\partial z}$	6
7(b)	If ω is a complex cube root of unity, prove that $(1-\omega)^6=-27$	6
7(c)	If $y=x\log\left[(ax)^{-1}+a^{-1}\right]$, where '$a$' is a constant, prove that $x(x+1)\ \frac{\partial^2 y}{\partial x^2}+x\frac{\partial y}{\partial x}=y-1$	8

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ESE NOVEMBER 2019

SET A

Program: F.Y. B.Tech Civil Engineering **Duration:** 03 Hours

Course Code: ES-BT103 **Maximum Points:** 100

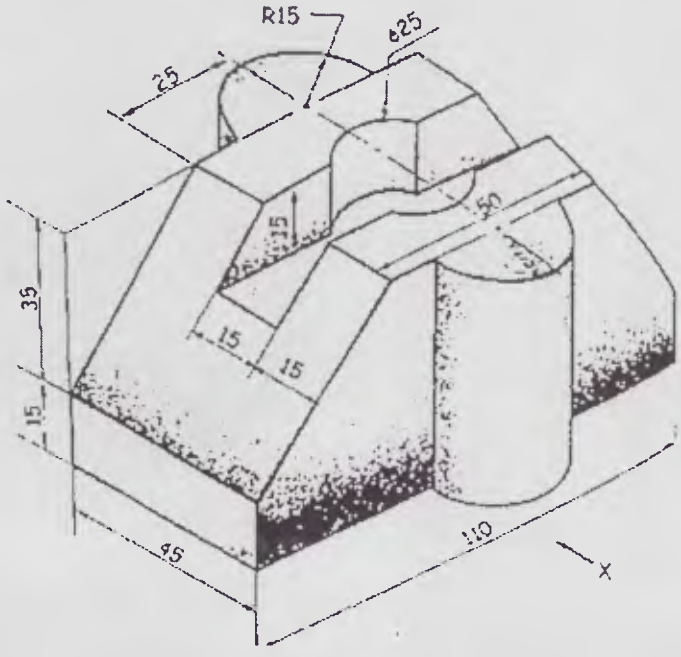
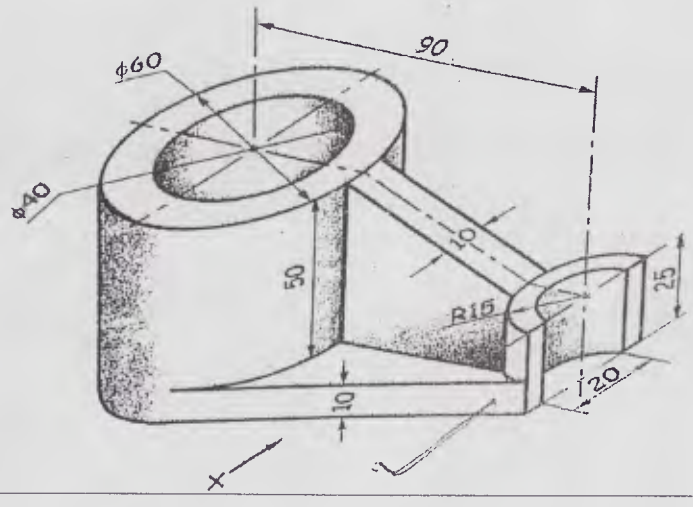
Course Name: Engineering Graphics I **Semester:** I

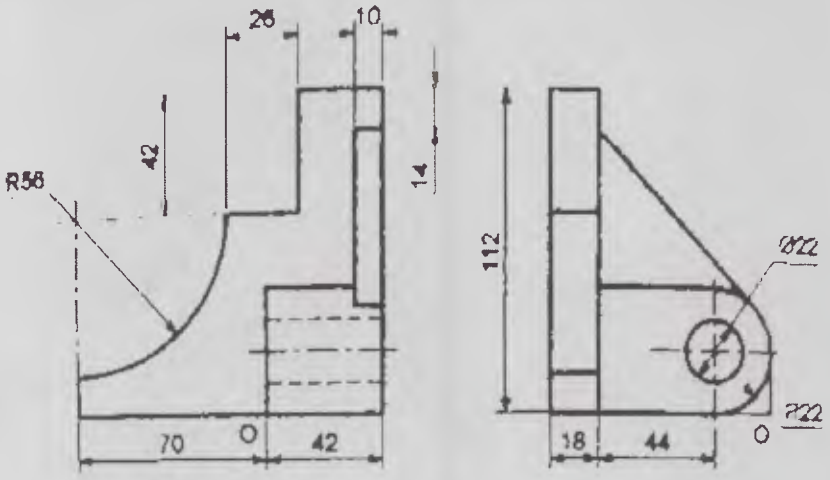
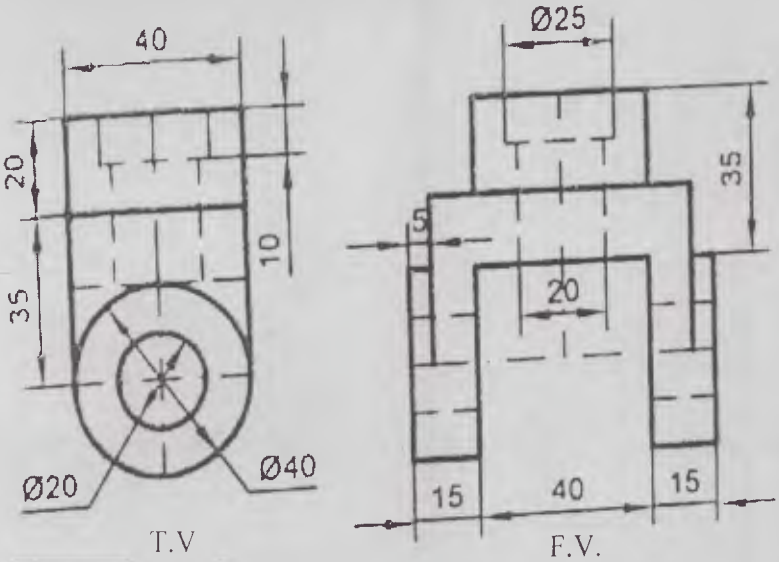
Exam Seat No.	
System No.	
Invigilator Signature	

Instructions:

- Attempt any **FIVE** questions
- Assume suitable data wherever necessary and justify the same
- Answers to all questions should be grouped together
- Save the drawings frequently in the folder and ensure that drawings are uploaded on the server infront of students after exam

Q.No.	Questions	Points	CO	BL	PI
Q1 (a)	An ideal gas expands according to Boyel's law PV=A constant. Pressure P is 3 N/cm^2 and volume V is 0.06 cm^3. Select a suitable scale and plot the expansion curve.	10	CO1	L3	1.3.1
Q1 (b)	Draw a hypocycloid when the radius of directing circle is twice the radius of generating circle. Radius of generating circle is 35 mm.	10	CO1	L3	1.3.1
Q2 (a)	The mid point of a straight line AB is 60 mm above HP and 50 mm infront of VP. The line measures 80 mm long and inclined at an angle of 30^0 to HP and 45^0 to VP. Draw its projections.	10	CO1	L3	1.3.1
Q2 (b)	A line AB 60 mm long has its end A in both the H.P. and V.P. It is inclined at $45^0$to HP and 30^0 to VP. Draw the projections of the line AB and determine its traces.	10	CO1	L3	1.3.1
Q3 (a)	A thin 30^0-60^0 set square has its longest edge in VP and inclined at 30^0 to HP. Its surface makes 45^0 with VP. Draw its projections.	10	CO1	L3	1.3.1
Q3 (b)	A circular lamina of 60 mm diameter rests on H.P. on a point on the circumference. The lamina is inclined to HP such that the top view of it is an ellipse of minor axis 35 mm. The TV of the diameter through the point makes an angle of 45^0 with VP. Draw the projections and determine the angle made by the lamina with the HP.	10	CO1	L4	1.3.1
Q4 (a)	A frustum of a square pyramid, top base side 20 mm, bottom base side 60mm has one of its bottom base sides in the H.P. and parallel to the VP while the trapezoidal face containing that the base side is vertical and away from the observer. Draw plan and elevation of the frustum.	10	CO1	L4	1.3.1
Q4 (b)	A square prism with side of base 40 mm and axis length 60 mm has one of its side of base in the VP, which makes an angle 45^0 with the HP and axis inclined at an angle 30^0 with the VP. Draw its projections.	10	CO1	L3	1.3.1

Q5 (a)	Figure shows the pictorial view of an object. Using first angle method of projection to draw: a) FV in the direction of X b) TV 	10	CO4	L4	1.3.1
Q5 (b)	Figure shows the pictorial view of an object. Using first angle method of projection to draw : a) FV in the direction of X b) SV 	10	CO4	L4	1.3.1

Q6	Draw the isometric view of the following object using natural scale  	20	CO4	L6	1.3.1
Q7	F.V. and R.H.S.V. of an object are as shown in Figure, Draw the missing view of an object by using first angle method of projection.  	20	CO2	L6	1.3.1