Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)

Munshi Nagar, Andheri (West), Mumbai – 400058

End Semester Test

MAY, 2017   Civil

Program: Construction Management

Course code: MTCM151

Name of the Course: Legal Aspects in Construction

Duration: 4 Hour

Maximum Marks: 100

Semester: II

Master file.

Instructions: Attempt any 5 Questions

	Max. Marks	Course Outcome Number	Module No.

Q1 (A) Choose the correct codes

		10	02	02

1. Find out correct statements
   I.   A fixed-price contract is a type of contract where the payment amount does not depend on resources used or time expended
   II. Unit price contract of contract is based on estimated quantities of items included in the project and their unit prices. The final price of the project is dependent on the quantities needed to carry out the work.
   a) Both I & II
   b) Only II
   c) Only I
   d) Neither I & II

2. Consider following statements about Single tendering
   a) Single response to an open bid can be termed as Single Tender
   b) If only a particular firm is the manufacture then one can go for single
   c) Single tendering can be done for emergent need to procure from a particular source tender
   d) Technical reason is to be recorded in single tendering
   Choose **incorrect** statement.

	02	02

3. Find out INCORRECT statements
   I.   Arbitration is a confidential process.
   II. Compared to court proceedings, it is a relatively slow process.
   a) Both I & II
   b) Only II
   c) Only I
   d) Neither I & II

	04,06	04

1

4. Supreme courd have laid some principles regarding bidding. Find out **CORRECT** statement.   02,04,06   02
   a) Government organizations are allowed to work in secrecy in dealing with contracts.
   b) Reasons for administrative decisions can or cannot be recorded.
   c) Tendering Process or Public Auction is the basic requirement for the award of any contract.
   d) Adequate publicity is not essential.

5. Which case is liable for compensation under workman compensation act   05   05
   a) the workmen having been at the time thereof under the influence or drugs
   b) the willful disobedience of the workman to an order expressly given
   c) In respect of any injury which does not result in the total or partial disablement of the workmen for a period exceeding three days
   d) Who has contracted an occupational disease

(B)	Do you think there is scope to improve existing Indian Contract Law? Explain briefly.	10	03	03
Q2 (A)	How is an arbitrating tribunal formulated for construction projects?	10	04,06	04
(B)	What are advantages and disadvantages of Adjudication and Mediation	10	04,06	04
Q3 (A)	Differentiate between LAY-OFF and LOCK-OUT	10	05	05
(B)	What are circumstances in which employer is not liable to compensation under workman compensation act	10	05	05
Q4 (A)	Explain any 5 types of contracts	10	02,04	02
(B)	Discuss ways to discharge contract	10	02,04	02
Q5 (A)	Why do you think minimum wages act is needed? What are components of fixing minimum wages?	10	05,06	06
(B)	Summarise payment of wages act	10	06	06
Q6 (A)	What are rules to govern minors agreement	10	03	03
(B)	Elaborate FIDIC types of contract	10	07	07
Q7	write short note on	20	01.02,03, 04	02,03

Q7   write short note on
   a) Wager agreement
   b) Contingent agreement
   c) Fraud
   d) Misrepresentation

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Sardar Patel College of Engineering
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Munshi Nagar, Andheri (West), Mumbai – 400058.
End Semester Exam
May 2017 (SET A)

Max. Marks:100
Class: F.Y.B.Tech(Mechanical)Semester:II
ENGINEERING

Duration: 3HR
Program:MECHANICAL

Name of the Course:Engineering Graphics-II Course Code : BT203	Exam Seat No	
	Reg.NO.	
	Machine NO.	
	Sign of Invigilator	

Master file.

Instructions:

1. All Questions are compulsory.
2. Draw neat diagrams.
3. Assume suitable data if necessary and clearly indicate the same.
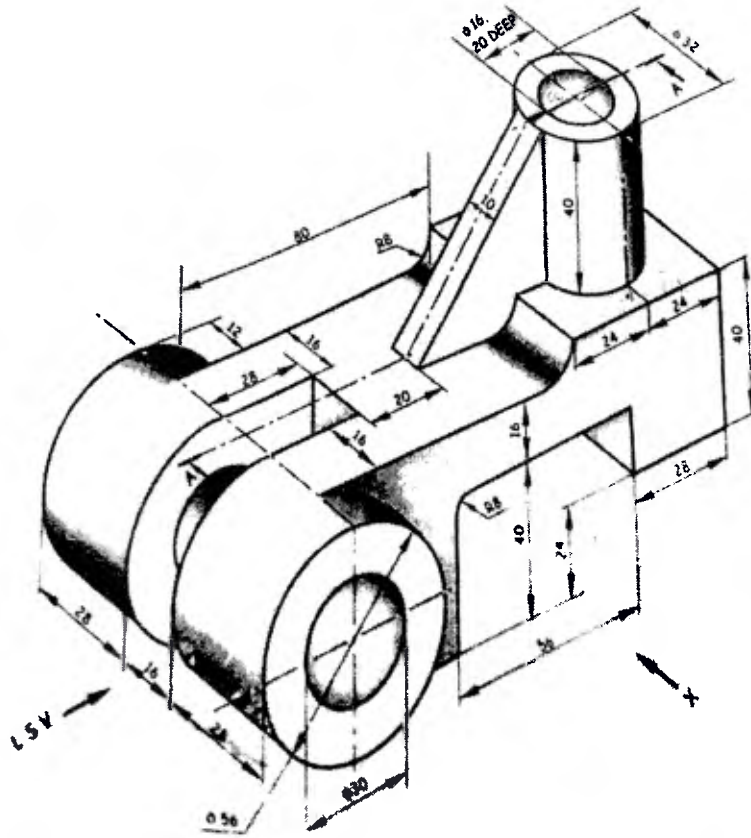4. Use only **First angle projection** method.

Question No		Maximum Marks	CO NO	Module No.
Q1	Draw the following orthographic projection view of figure 1 1}FRONT VIEW 2} TOP VIEW 3} LHSV	20	1,4	2

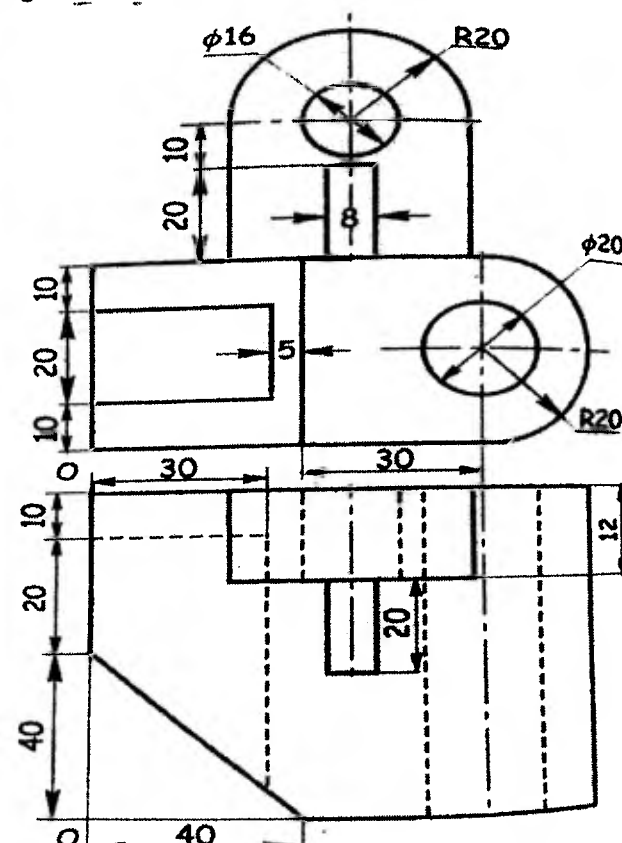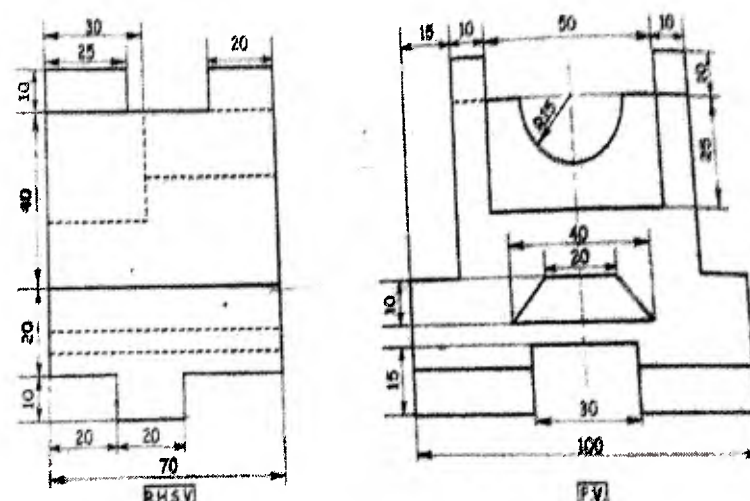|		Draw the following views by the first angle method of projection 1]sectional front view along the direction of an arrow X and the section along A-A 2] Top view 3]LHSV	20	1,4	3

Q2.

Q3	Shows two view of an object. Draw its isometric view with O as origin.	20	2,4	5

Q4	Show the front view and R.H.S.V of an object. Draw the given views and draw the missing TV.	20	3,4	6

Q5	(A) Draw any two type of bolt with suitable dimension.	10	4	7
	(B) Draw any two type of screw with suitable dimension.	10	4	7

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Sardar Patel College of Engineering
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Munshi Nagar, Andheri (West), Mumbai – 400058.
End Semester Exam
May 2017 (SET B)

Max. Marks:100
Class: F.Y.B.Tech(Mechanical)Semester:II
ENGINEERING

Duration: 3HR
Program:MECHANICAL

Name of the	Exam Seat No	
Course:Engineering	Reg.NO.	
Graphics-II	Machine NO.	
Course Code : BT203	Sign of Invigilator	

Master file.

Instructions:
1. All Questions are compulsory.
2. Draw neat diagrams.
3. Assume suitable data if necessary and clearly indicate the same.
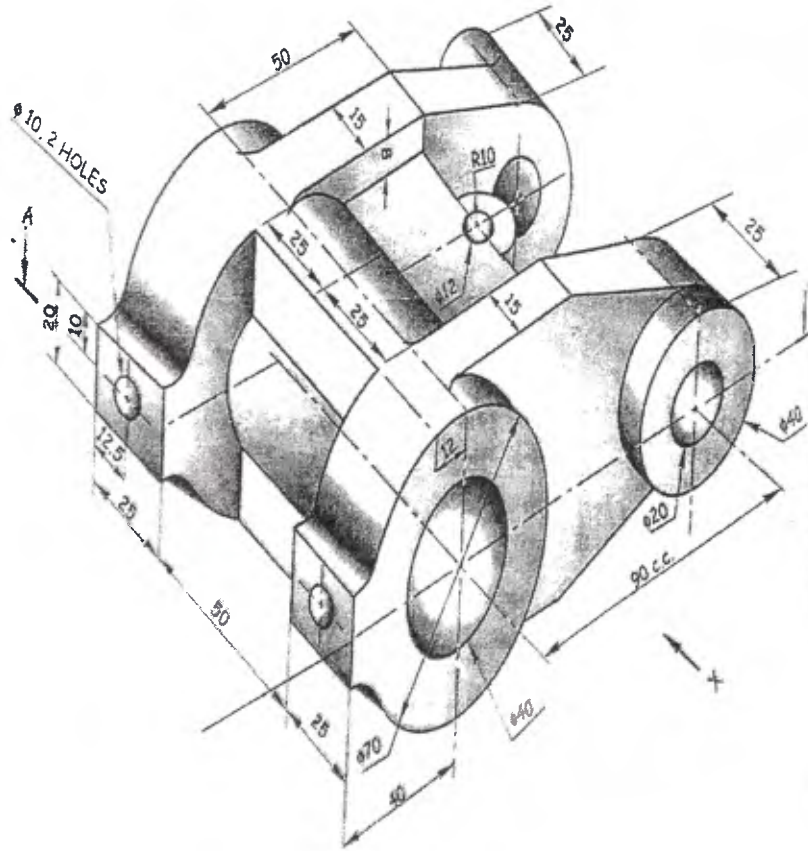4. Use only **First angle projection** method.

Question No		Maximum Marks	CO NO	Module No.
Q1	Draw the following orthographic projection view of figure 1}FRONT VIEW 2} TOP VIEW 3} LHSV	20	1,4	2

Q2.

Draw the following views by the first angle method of projection   20   1,4   3
1] A front view along the direction of an arrow X.
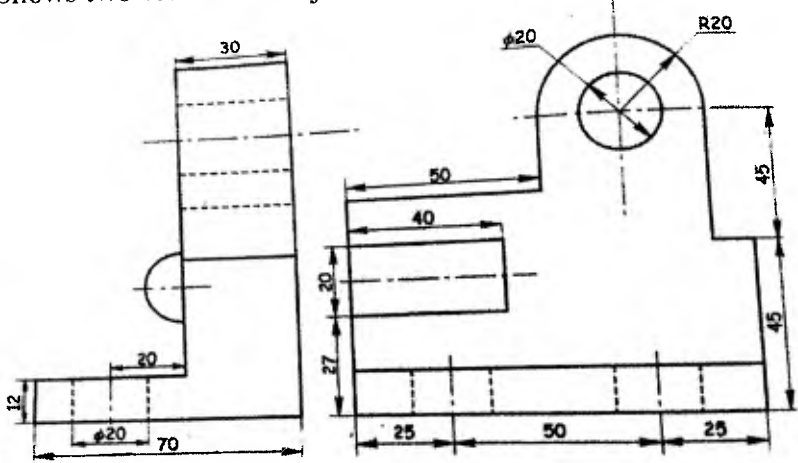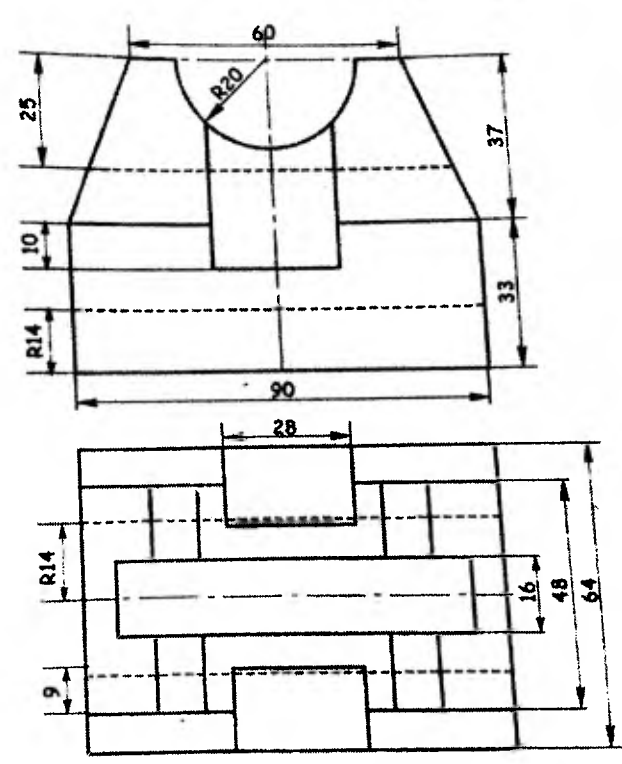2] A sectional top view on section plane A-B
3]LHSV

| Q3 | Shows two view of an object. Draw its isometric view. | 20 | 2,4 | 4,5 |

| Q4 | Shows two views of an object. Draw the given views and draw the missing LHSV. | 20 | 3,4 | 6 |

| Q5 | (A) Draw any two type of nut with suitable dimension. | 10 | 4 | 7 |
| | (B) Draw any two type of stud with suitable dimension. | 10 | 4 | 7 |

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End Semester Exam

May 2016

Max. Marks:100

Class: F.Y.B.Tech(Civil)   SET B

Program:Civil Engineering

Name of the Course:

Engineering Graphics-II

Course Code : BT203
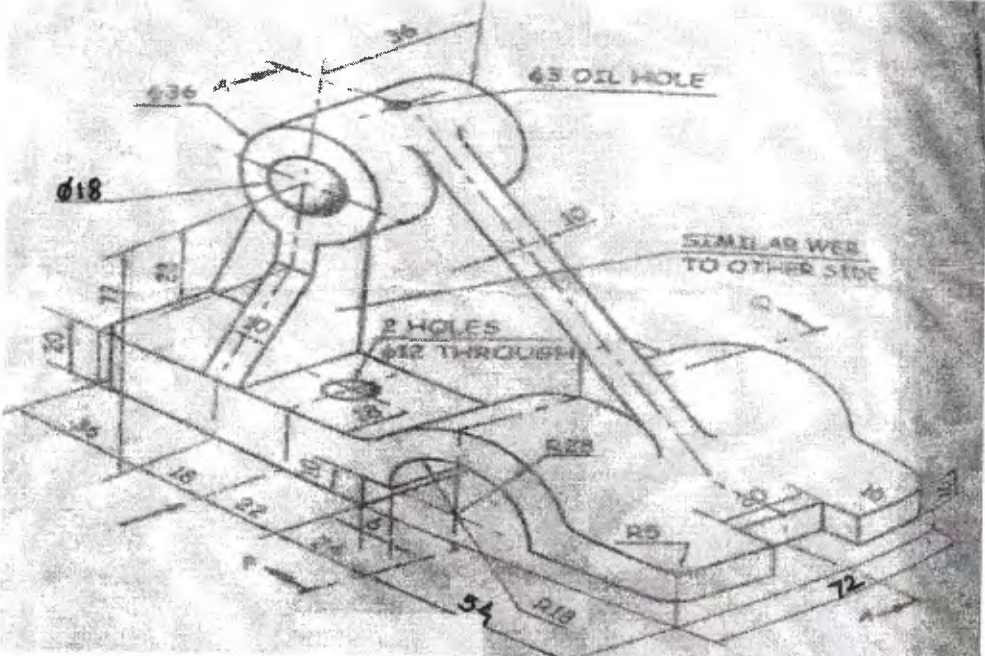
Duration: 3HR

Semester:II

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

Master file.

Instructions:
1. **All questions are compulsory.**
3. **Draw neat diagrams**
4. **Assume suitable data if necessary and clearly indicate the same.**

Q. No		Max. Marks	CO NO	Module No.
Q.1	The following fig.shows pictorial view of a block.Draw the following views by using first angle method of projection: 1. FRONT VIEW 2. LHSV 3. TOP VIEW 	20	1,4	2

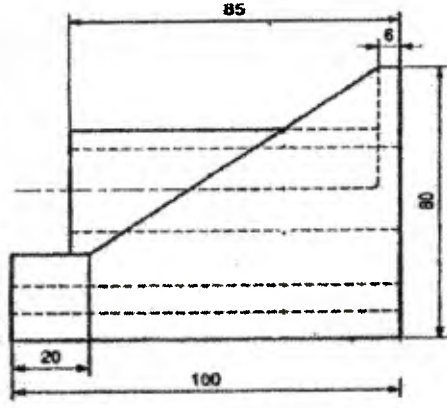| Q. No		Max. Marks	CO NO	Module No.
Q.2	The following fig.shows pictorial view of a block.Draw the following views by using first angle method of projection: 1. SECTIONAL FRONT VIEW along the section A-A 2. RHSV 3. TOP VIEW 	20	1,4	3
Q.3	Given figure shows orthographic views of an object by first angle projection method. Taking 'O' as origin draws its isometric view, give only major dimensions. 	20	2,4	4,5

Q. No		Max. Marks	CO NO	Module No.
Q.4	Given figure shows front view and left side view of a machine part. Draw 1) Sectional Front View, along section A – A. 2) Top View. 3) Left Hand Side View. 4) Dimensioning.	20	3,4	5
	  Front View　　　　　　　　　**L.H. Side View**			
Q.5	(A) Draw any two types of screws. Use suitable data wherever necessary	10	4	7
	(B) Draw any two types of stud. Use suitable data wherever necessary.	10	4	7

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End Semester Exam

May 2017

Max. Marks: 75 marks   Duration: 3.0 H
Class: F.Y B.TECH   Semester: **II**   Program:
Name of the Course: **Applied Chemistry -II**   Course Code : BT-206

Master file.

Instructions:

1 questions no 1 is compulsory
2 Attempt any three out of remaining four
3 Draw neat labeled diagrams

Question No	Question	Max. Marks	Course Outcome Number	Mod. No.
Q1				
a	A Coal sample contain following composition by weight C=80%, H=5%,O=5%, S=2%,N=3% and Ash=5% calculate gross and net calorific value	5	3	6
b	5.0 g of sample taken for nitrogen estimation by Kjeldahls method. The ammonia required 15 ml of 0.5N H_2SO_4 for Neutralization. Using bomb calorimeter 3.0 g of coal sample produced 0.60 g of $BaSO_4$. Calculate percentage of Nitrogen and Sulphur in coal sample	5	3	6
c	Calculate the Atom Economy for following reaction $$C_6H_5NH_2 + (CH_3CO)_2O \longrightarrow C_6H_5NHCOCH_3 + CH_3COOH$$	5	4	7
Q2				
a	Why temporary modification or derivatization avoided? explain with suitable chemical reaction. What are industrial green solvent	10	4	7
b	What are limitations of ferrous alloy? Explain advantages of aluminum alloy over ferrous alloy	5	2	4
c	Explain alloy of copper with its composition properties and application	5	2	4

Q3				
a	Explain determination of nitrogen and sulphur by Ultimate analysis with its significance	**10**	3	6
b	Write short note on Cetane Value Diesel fuel	**5**	3	6
c	Explain limitation of direct use of oil as fuel. Write biodiesel synthesis	**5**	3	6
Q4				
a	Explain atmospheric corrosion with its mechanism	**10**	1	1
b	Explain the cathodic protection of metal	**5**	1	2
c	Explain waterline corrosion with suitable example	**5**	1	2
Q5				
a	Explain electrochemical and Galvanic series. Write difference between Electrochemical and Galvanic series	**10**	1	1
b	What is cracking of crude petroleum why catalytic cracking is better than thermal cracking	**5**	3	6
c	What are antiknocking agents? Explain its role petrol	**5**	3	6

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End Semester Exam
May 2017

Max. Marks: 100
Class: F.Y.B.Tech   Semester:II

Name of the Course : Computer Programming
Course Code : BT207

Duration: 3 hours
Program: (C/E/M)

Master file.

Instructions:
- **Q1 is compulsory. Attempt any FOUR from** remaining SIX
- Assume suitable data wherever necessary.

			Max. Marks	Course Outcome Number	Module No.
1.	A	Write an algorithm and draw a flow chart to find GCD and LCM of two numbers.	10	1	1
	B	Discuss the salient features of OOPs.	05	3	6
	C	Explain recursive functions.	05	2	4
2.	A	Create class A which has one private integer variable. Also contains one function to take in the value and another function to display the value. Create Class B which has one private floating point variable. Also contains one function to take in the value and another function to display the value. Write a program to divide the integer value with floating point value and display the result with help of some additional function. (Avoid inheritance).	10	3	6
	B	Write a program to add two matrices.	10	2	5
3.	A	Write a program to enter a number and say whether it is even or odd number. Use switch statement.	05	2	3
	B	Describe different types of inheritance and explain hybrid inheritance with an example. Also explain how multiple copies of functions can be avoided while inheriting the same class via different paths.	15	3	6

4.	A	Explain the following with an example i. Loop which is exit controlled ii. If-else statement	10	1	4
	B	Explain the concept of overloading of functions and overriding of functions.	10	2,3	5,6
5.	A	Write a program to print the Fibonacci series up till n terms. 1 1 2 3 5 8	10	1	3
	B	Write a program to find ncr where n and r are supplied by the user.	10	1,2	3,4

6.		Define a class str that could work as a user defined datatype. Include constructors that will enable us to create an uninitialized string
		str s1;
		and also to initialize an object with a string constant at the time of creation like
		str s2("Well Done!");
		Include a function that adds two strings to make a third string. Note that the statement
		s2 == s1;
		will be perfectly reasonable expression to compare one string to another.
		Write a complete program to test your class to see that it does the following task:
		   a. Creates uninitialized string objects
		   b. Creates objects with string constants.
		   c. Concatenates two strings.
		   d. Compare one string with another using operator overloading.
		   e. Displays a desired string object.
			20	2,3	5,7

7.		Write Short Note on any three	20		
	A	Datatypes		1	2
	B	Continue Statement and Break Statement		1	3
	C	Run time Polymorphism		3	7
	D	Call by value and call by reference		2	4

Bharatiya Vidya Bhavan's
SARDAR PATEL COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to University of Mumbai)

End Semester Examination for F.Y.BTech (Civil/Mechanical/Electrical)
2016-17

17/05/2017

Total marks: **75**   Duration: **3 Hrs**

Class/Sem: **F.Y.BTech (C/M/E) Sem-II**   Subject : **APPLIED PHYSICS-II**
                                                 Course code: **BT205**

- Attempt any FIVE questions out of SEVEN questions
- **Answers to all sub questions should be grouped together.**
- Draw diagrams wherever necessary.
- Assume suitable data if necessary and state the assumption clearly.
- Figures to the right indicate full marks, course outcome number and module number respectively.

Good luck!

Master file.

Q. No		Max Mark	CO	Module no.
1				
(a)	Arrive at Lorentz transformation equations. A space ship moving away from the earth with velocity 0.6c fires a rocket whose velocity relative to the space ship is 0.7c away from the earth. What will be the velocity of the rocket, as observed from the earth?	8	CO3	V
(b)	Derive Gauss' law in integral form. Find the electric field at a distance z above the midpoint of a straight line segment of length 2L, which carries a uniform charge density λ. Reduce it to the form if we want to find for an infinite straight wire.	7	CO2	IV
2				
(a)	Derive an expression for interplanar spacing between parallel planes in a general lattice in terms of their Miller indices. A crystal lattice plane (326) makes an intercept of $1.5A^\circ$ on X-axis in a crystal having lattice constants $1.5A^\circ$, $2A^\circ$ and $2A^\circ$ respectively on X, Y and Z axes. Find the Y and Z intercepts.	8	CO1	I
(b)	Explain formation of characteristic X-ray spectrum and also draw the nature of the spectrum. The glancing angle of reflection for the first K_α X-rays from Palladium are 5.4° from the (100) planes, 7.6° from (110) planes and 9.4° from the (111) planes. Determine the cubic lattice structure of the crystal.	7	CO1	II

3

(a) Write a short note on diamond structure explaining its unit cell properties. For explaining the coordination number, consider any one corner atom as a reference. Find the diffraction angle corresponding to the first order if X-rays of wavelength $0.863A^\circ$ are reflected from the (110) plane of a diamond structure. Given that radius of carbon atom is $5A^\circ$. | 8 | CO1 | I&II

(b) Define the terms proper length and proper frame. State length contraction formula. Calculate the percentage contraction of a rod moving with a velocity of light in the direction at 60° to its own length. | 7 | CO3 | V

4

(a) Derive an expression for potential in terms of electric field. Find the potential inside and outside a spherical shell of radius R which carries a uniform surface charge. Set the reference point at infinity. | 8 | CO2 | IV

(b) Write a note on Bragg's spectrometer. Monochromatic X-rays of wavelength $0.82A^\circ$ undergo first order Bragg reflection from a crystal of cubic lattice with lattice constant $3A^\circ$, at a glancing angle of $7^\circ 51' 48''$. Identify the Bragg planes which give rise to this reflection in terms of their Miller indices. | 7 | CO1 | II

5

(a) Explain (i) magnetomotive force, (ii) reluctance, (iii) permeance, (iv) Ohm's law for magnetic circuits with proper definition and units. Calculate current required for producing 2.7×10^{-3} Wb due to an iron ring of cross sectional area of $60cm^2$, having 50cm mean diameter and an air gap of 1mm. Given that relative permeability is 900 and number of turns are 400. | 8 | CO2 | III

(b) Describe the three important plane orientations in an FCC structure. X-rays are reflected from (110) of such FCC structure with an atomic radius $1.28A^\circ$. Find the Bragg angle corresponding to the the first order. Given that the wavelength of incident X-rays is $1.4A^\circ$. | 7 | CO1 | I&II

6

(a) State and explain with example divergence theorem. Check the divergence theorem for the following function: $\bar{v} = r^2 \hat{r}$. | 8 | CO2 | IV

(b) Derive an expression for magnetization of paramagnetic materials using Langevin's theory. | 7 | CO2 | III

7

(a) Obtain the relativistic formula for addition of velocities and hence prove the second postulate of special theory of relativity. | 8 | CO3 | V

(b) Explain hysteresis curve using domain theory. Calculate energy loss per minute in an iron core of a transformer, if area of hysteresis loop is equivalent to 3800erg/cc. Frequency is 100 cycles/s, density of iron is 7.5gm/cc and mass of iron core is 40kg. | 7 | CO2 | III

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Program: F.Y.B.Tech. (Civil/Mechanical/Electrical)

Course code: BT204

Name of the Course: Engineering Mechanics-II

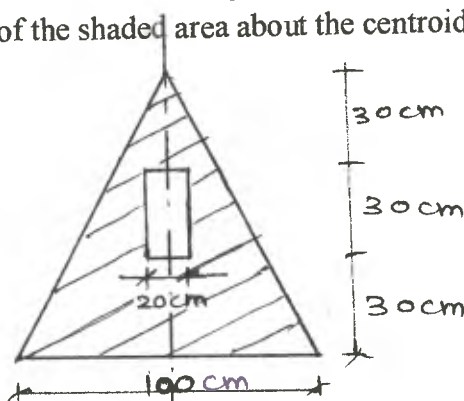**Semester: II**

Date: 15/05/2017
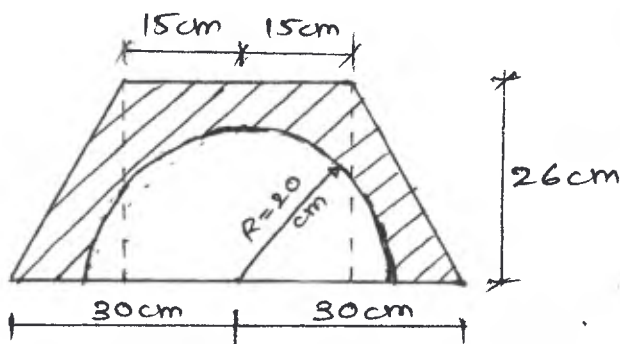
Duration : 3 Hr

Maximum Marks : 100

Instructions:

1) Question **No.1** is compulsory.

2) Out of remaining questions, attempt any **FOUR** questions.

3) In all **FIVE** questions to be attempted.

4) All questions carry equal marks.

5) Answers to each question to be started on fresh page.   *Master file.*

Q. No.		Maximum Marks	Course Outcome Number	Module No.
Q.1a)	Explain radius of gyration and product of inertia.	5	1	2
b)	Explain uniform motion and uniformly accelerated linear motion.	5	2,3	3,5
c)	State and explain D'Alembert's principle. Why it is called principle of dynamic equilibrium?	5	2,3	5,7
d)	Explain impact and various types of impact along with neat sketches.	5	2,3	6
Q.2 a)	A rectangular hole is made in a triangular area as shown. Find the moment of inertia of the shaded area about the centroidal x and y axis.	12	1	2
Q.2 b)	A wheel rotating about a fixed axis at 20 revolutions per minute is uniformly accelerated for 70 seconds during which it makes 50 revolutions. Determine (i) angular velocity at the end of this interval and (ii) time required for the velocity to reach 100 revolutions per minute.	8	2	3

Q.3 a)	Determine the centroid of the shaded portion.	10	1	1

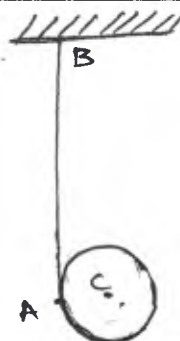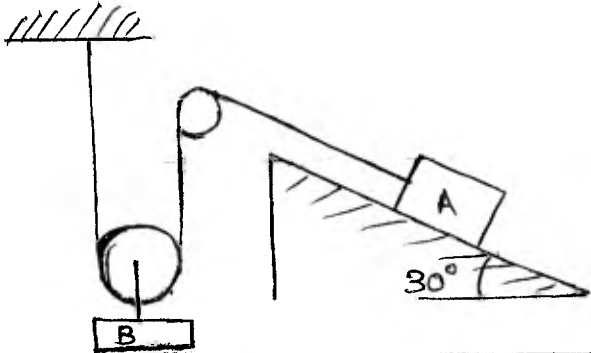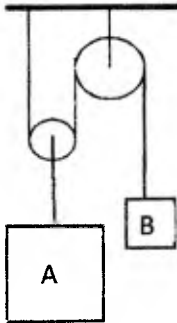|				
Q.3 b)	Two balls of mass 2 kg and 4 kg are moving in the same direction with velocities of 6 m/s and 1.5 m/s respectively inclined at 45^0 and 60^0 with the line of impact. If the coefficient of restitution is 0.6, determine their velocities in magnitude and direction after impact.	10	2,3	6
Q.4 a)	A projectile is aimed at a mark on the horizontal plane through the point of projection and falls 12m short when the angle of projection is 250, while it overshoots the mark by 24m when the angle of projection is 600. Determine the angle of projection to hit the mark. Assume no air resistance.	10	2	3
Q.4 b)	In the mechanism shown, AB rotates clockwise with an angular velocity of 10 rad/s. Determine the angular velocities of bars BC and CD when the bar makes an angle of 30^0 with the horizontal, bar CD makes an angle of 60^0 and the bar BC is horizontal.	10	2	4
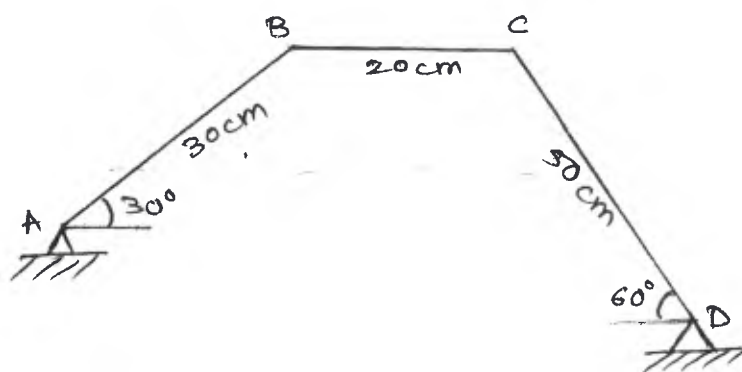
Q.5 a)	A cylinder of weight 750 N and radius 0.1 m is suspended from a string that is wound around its circumference as shown. If the cylinder is allowed to fall freely, determine the acceleration of its mass centre C and the tension in the string.	10	3	7

		10	1	3
Q.5 b)	A stone is thrown vertically upwards with a velocity of 18 m/s from an elevation of 40 m above the ground level. Two second later, another stone is thrown vertically upwards with a velocity of 25 m/s from an elevation of 15 m above the ground level. Determine when and where both the stones will meet.	10	1	3
Q.6 a)	A system of blocks shown is initially at rest. Block A and B weigh 800N and 1600 N respectively. The coefficient of friction between block A and inclined plane is 0.3, determine the velocity of block A when it moves 1 m along the plane. The pully is frictionless and weightless.	10	2	6
Q.6 b)	Two ships A and B moves simultaneously from port, ship A is moving in N 45^0 W at 25 kmph and ship B is moving in S60^{0}W at 15 kmph. Determine **(i)** relative velocity of ship A with respect to ship B. (ii) distance between two ships after 1 hr (iii)at what time both ships will be 15 km apart?	10	2	3
Q.7 a)	An arrangement of pulys is as shown. The mass of blocks A and B are 15 kg and 5 kg respectively. Calculate the acceleration of the two blocks and the tension in the string. If the system of blocks is released from rest, determine the velocity and the distance travelled by each block at the end of 10 second.	10	2	4
Q.7 b)	A particle is moving with simple harmonic motion and performs frequency of 12 oscillations per minute. At a distance 10 cm from the mean position, its velocity is 0.5 of the maximum velocity. Determine, (i) the amplitude of oscillation (ii) maximum acceleration (iii) velocity of partical when it is at a distance of 6 cm from the mean position.	10	2	3

Lib
8/5/17

Bharatiya Vidya Bhavan's
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Munshi Nagar, Andheri (West), Mumbai – 400058.

May 2017

Maximum Marks: 100

Class: F.Y.B.Tech   Semester: II

Name of the Course: Engineering Mathematics II

Duration: 3 hours

Program: C/M/E

Course Code : BT201

Master file.

Instructions:

- Attempt any FIVE questions out of SEVEN questions.
- Answers to all sub questions should be grouped together.

Q		Marks	CO	Module
1(a)	Find the total length of the curve: $\left(\dfrac{x}{a}\right)^{\frac{2}{3}}+\left(\dfrac{y}{b}\right)^{\frac{2}{3}}=1$.	6	1	1
(b)	Evaluate $\iint \dfrac{y}{(a-x)\sqrt{ax-y^2}}dxdy$, where R is the region bounded by $y^2=ax$ and $y=x$.	6	1	2
(c)	Solve $\dfrac{dy}{dx}=1-x(y-x)-x^3(y-x)^2$	8	3	4
2 (a)	Solve $(D^2+a^2)y=\operatorname{cosec} ax$	6	3	5
(b)	Evaluate $\displaystyle\int_0^\infty \sqrt{x}e^{-x^2}dx \cdot \int_0^\infty \dfrac{e^{-x^2}}{\sqrt{x}}dx$	6	2	6
(c)	Find the area outside the circle $r=a$ and inside the cardioide $r=a(1+\cos\theta)$	8	1	2
3 (a)	Find the mass of the lamina in the form of a cardioide $r=a(1-\cos\theta)$ if the density at any point varies as the distance from the pole.	6	3	2
(b)	Prove that $\displaystyle\int_0^1 \dfrac{x^{m-1}+x^{n-1}}{(1+x)^{m+n}}dx=\beta(m,n)$	6	2	6
(c)	Solve $(D^3-3D^2+9D-27)y=\cos 3x$	8	3	5

1

4 (a)	Use differentiation under the integral sign to prove that $$\int_0^\infty \frac{\tan^{-1}(ax)}{x(1+x^2)}dx = \frac{\pi}{2}\log(1+a), \text{ if } a \geq 0.$$	6	2	7
(b)	Solve $\dfrac{dy}{dx} = \dfrac{\tan y - 3x^4}{x\sec^2 y - x^2\cos y}$	6	3	4
(c)	Solve $x^2\dfrac{d^2y}{dx^2} + 5x\dfrac{dy}{dx} + 3y = (1+\dfrac{1}{x})^2 \cdot \log x$	8	3	5
5 (a)	Express $\displaystyle\int_{-\pi/3}^{\pi/6} (\sin\theta + \sqrt{3}\cos\theta)^{1/6}d\theta$ as a beta function.	6	2	6
(b)	Solve $(D^2+1)y = x\sin x$	6	3	5
(c)	Evaluate $\displaystyle\int_1^e\int_1^{\log y}\int_1^{e^x} \log z \; dxdydz$	8	2	3
6(a)	By changing into polar coordinates evaluate $$\int_0^4\int_{\sqrt{4x-x^2}}^{\sqrt{16-x^2}} \frac{1}{\sqrt{16-x^2-y^2}}dxdy$$	6	1	2
(b)	Solve $(D^3 - 7D - 6)y = (x^2 - 3x + 4)e^{2x}$	6	3	5
(c)	Find the volume bounded by the cylinder $y^2 = x, x^2 = y$ and the planes $z = 0, \; x+y+z = 2$	8	2	3
7(a)	Solve $\left(2xy^4e^y + 2xy^3 + y\right)dx + \left(x^2y^4e^y - x^2y^2 - 3x\right)dy = 0$	6	3	4
(b)	Assuming the validity of differentiation under integral sign, show that $\displaystyle\int_0^\infty e^{-x^2}\cos 2ax\,dx = \frac{\sqrt{\pi}}{2}e^{-a^2}$. Given that $\displaystyle\int_0^\infty e^{-x^2}dx = \frac{\sqrt{\pi}}{2}$	6	2	7
(c)	Evaluate $\displaystyle\iint \frac{ye^{2y}}{\sqrt{(1-x)(x-y)}}dxdy$, where R is the region of the triangle whose vertices are (0, 0), (1, 0) and (1, 1).	8	1	2

2

Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)

Munshi Nagar, Andheri (West), Mumbai – 400058.

End Semester Exam

May 2016

Max. Marks:100   Duration: 3HR

Class: F.Y.B.Tech(Electrical)   SET A   Semester:II
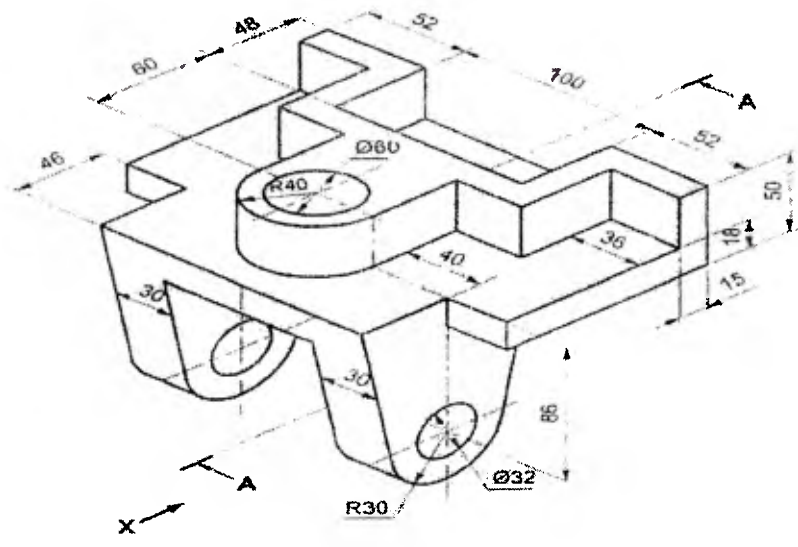
Program: Electrical Engineering

Name of the Course:	Exam Seat No	
Engineering Graphics-II	Reg.NO.	
Course Code : BT203	Machine NO.	
	Sign of Invigilator	

Master file.

Instructions:

1. All questions are compulsory.
3. Draw neat diagrams
4. Assume suitable data if necessary and clearly indicate the same.

Q. No		Max. Marks	CO NO	Module No.
Q.1	The following fig.shows pictorial view of a block.Draw the following views by using first angle method of projection: 1. FRONT VIEW 2. RHSV 3. TOP VIEW 	20	1,4	2

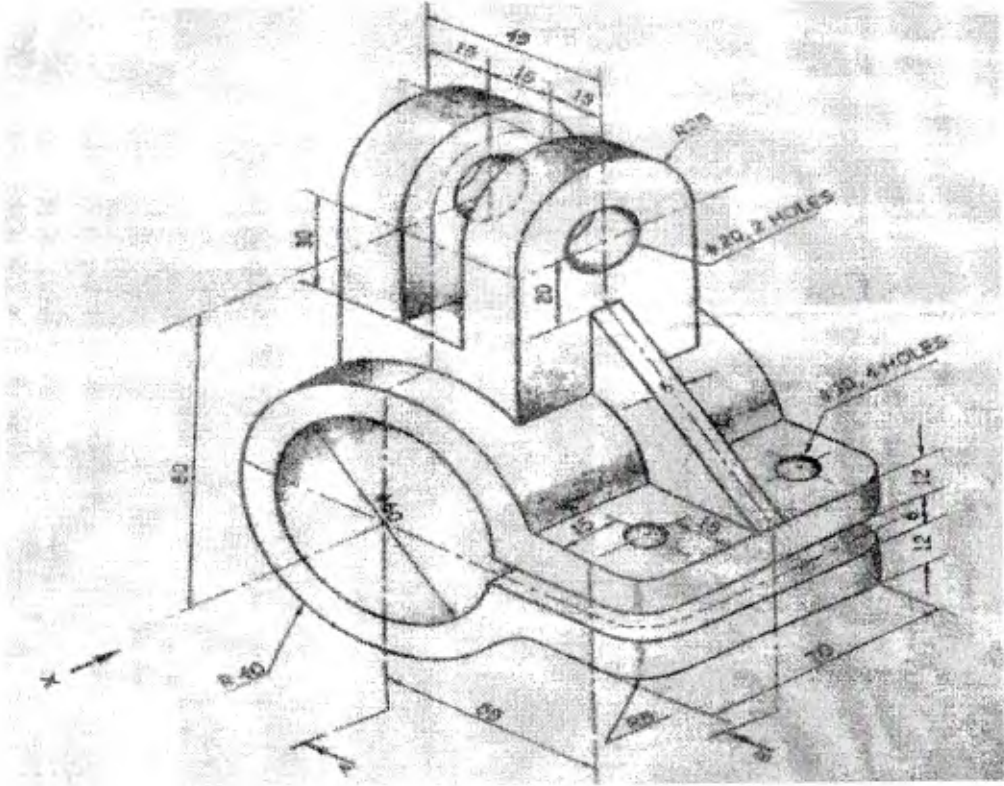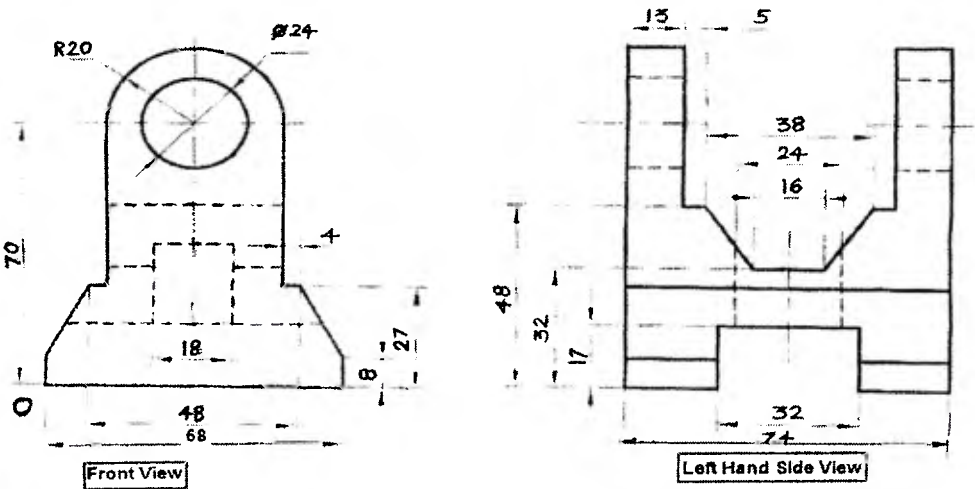| Q. No		Max. Marks	CO NO	Module No.

Q.2	The following fig.shows pictorial view of a block.Draw the following views by using first angle method of projection:
	    1. FRONT VIEW
	    2. SECTIONAL RHSV along the section A-A
	    3. TOP VIEW
	
		20	1,4	3

Q.3	Given figure shows orthographic views of an object by first angle projection method. Taking 'O' as origin draws its isometric view, give only major dimensions. 	20	2,4	4,5

Q. No		Max. Marks	CO NO	Module No.
Q. 4	Given figure shows front view and left side view of a machine part. Draw a) Sectional Front View, along section A – A. b) Top View. c) Left Side View. d) Dimensioning.	**20**	**3,4**	**6**

F.V.   L.H.S.Y.

Q.5	(A)Draw any two types of stud. Use suitable data wherever necessary	**10**	**4**	**7**
	(B) Draw any two types of nut. Use suitable data wherever necessary.	**10**	**4**	**7**

Lib
13/05/17

Max. Marks:100   Duration: 3HR
Class: F.Y.B.Tech(Electrical)   SET B   Semester:II
Program: Electrical Engineering

Name of the Course:	Exam Seat No	
Engineering Graphics-II	Reg.NO.	
Course Code : BT203	Machine NO.	
	Sign of Invigilator	

Master file.

Instructions:
1.   **All questions are compulsory.**
3.   **Draw neat diagrams**
4.   **Assume suitable data if necessary and clearly indicate the same.**

Q. No		Max. Marks	CO NO	Module No.
Q.1	The following fig.shows pictorial view of a block.Draw the following views by using first angle method of projection: 1. FRONT VIEW 2. RHSV 3. TOP VIEW	20	1,4	2

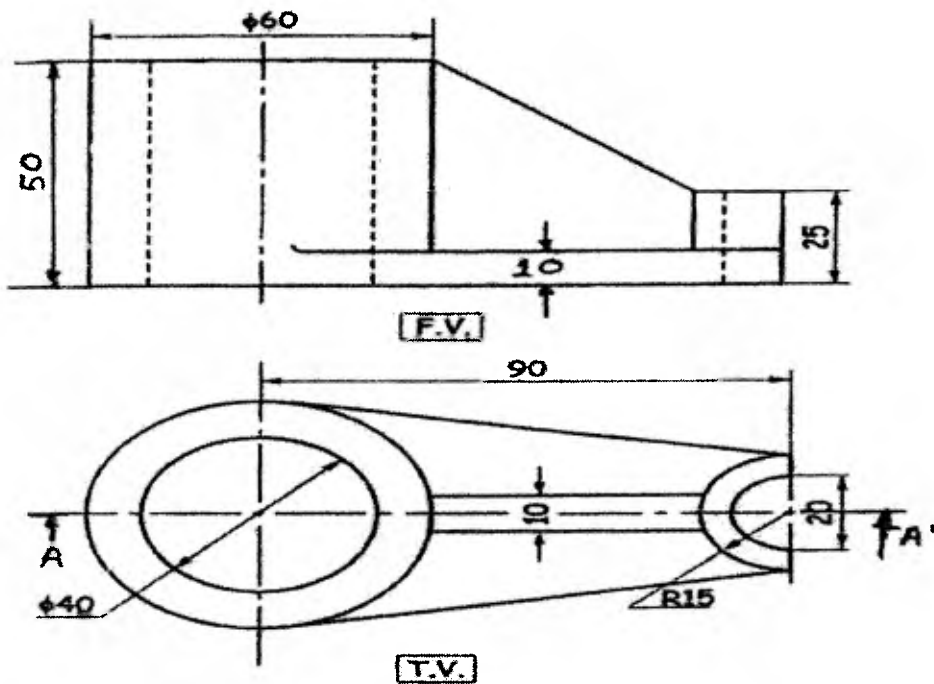| Q. No		Max. Marks	CO NO	Module No.

Q.2	The following fig.shows pictorial view of a block.Draw the following views by using first angle method of projection:
	   1. SECTIONAL FRONT VIEW along the section A-A
	   2. RHSV
	   3. TOP VIEW
	
		20	1,4	3

Q.3	Given figure shows orthographic views of an object by first angle projection method. Taking 'O' as origin draws its isometric view, give only major dimensions. 	20	2,4	4,5

Q. No		Max. Marks	CO NO	Module No.
Q.4	Given figure shows front view and left side view of a machine part. Draw a) Sectional Front View, along section A – A. b) Top View. c) Right Side View. d) Dimensioning.	20	3,4	6
Q.5	(A) Draw any two types of screws. Use suitable data wherever necessary	10	4	7
	(B) Draw any two types of bolt. Use suitable data wherever necessary.	10	4	7

Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

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Munshi Nagar, Andheri (West), Mumbai – 400058.
End Semester Exam
May 2016

Max. Marks:100

Duration: 3HR

Class: F.Y.B.Tech(Civil)   SET A

Semester:II

Program:Civil Engineering

Name of the Course:
Engineering Graphics-II
Course Code : BT203

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

Master file.

Instructions:
1.   **All questions are compulsory.**
3.   **Draw neat diagrams**
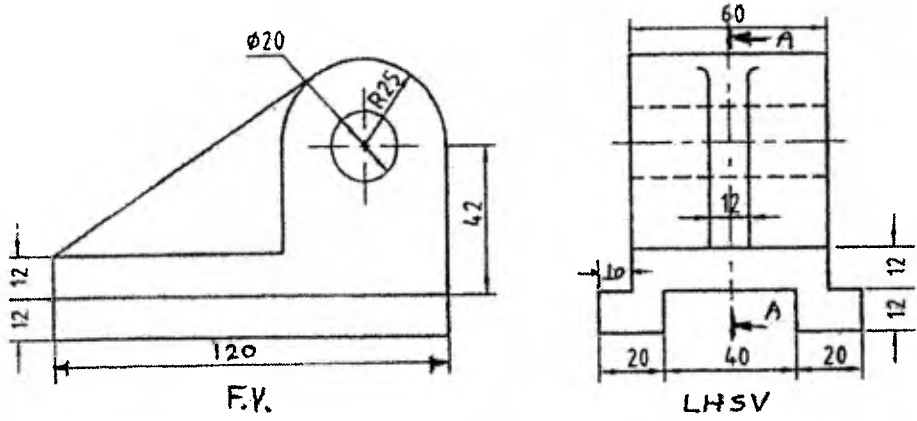4.   **Assume suitable data if necessary and clearly indicate the same.**

Q. NO.		Max. Marks	CO NO	Module No.
Q.1	The following fig.shows pictorial view of a block.Draw the following views by using first angle method of projection: 1. FRONT VIEW 2. LHSV 3. TOP VIEW 	20	1,4	2

Q. No		Max. Marks	CO NO	Module No.

Q.2	The following fig.shows pictorial view of a block.Draw the following views by using first angle method of projection:
	  1. SECTIONAL FRONT VIEW along the section A-A
	  2. RHSV
	  3. TOP VIEW
	
		20	1,4	3

Q.3	Given figure shows orthographic views of an object by first angle projection method. Draw its isometric view. Give major dimensions. 	20	2,4	4,5

Q. No		Max. Marks	CO NO	Module No.
Q.4	Given figure shows front view and left side view of a machine part. Draw a) Sectional Front View, along section A – A. b) Top View. c) Right Side View. d) Dimensioning. F.V. LHSV	20	3,4	5
Q.5	(A) Draw any two types of nut. Use suitable data wherever necessary	10	4	7
	(B) Draw any two types of bolt. Use suitable data wherever necessary.	10	4	7

Bharatiya Vidya Bhavan's
SARDAR PATEL COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to University of Mumbai)

Re Examination for F.Y.BTech (Civil/Mechanical/Electrical)
2016-17

Even Semester

23rd June 2017

Duration: **3 Hrs**

Total marks: **75**

Class/Sem: **F.Y.BTech (C/M/E) Sem-II**

Subject : **APPLIED PHYSICS-II**
Course code: **BT205**

Master file.

- Attempt any FIVE questions out of SEVEN questions
- **Answers to all sub questions should be grouped together.**
- Draw diagrams wherever necessary.
- Assume suitable data if necessary and state the assumption clearly.
- Figures to the right indicate full marks, course outcome number and module number respectively.

Good luck!

Q. No			Max Mark	CO	Module no.
1	(a)	Describe Michelson Morley experiment. The length of a rod is found to be half of its length when at rest. What is the speed of the rod relative to the observer?	8	CO3	V
	(b)	Derive Gauss' law in differential form assuming its integral form. Suppose the electric field in some region is found to be $\overline{E} = kr^3\hat{r}$, in spherical coordinates, (k is some constant), a. Find the charge density ρ. b. Find the total charge contained in the sphere of radius R, centered at the origin.	7	CO2	IV
2	(a)	Derive Bragg's law in crystal structures. Lead has an FCC structure with an atomic radius 1.746A°. Find the spacing of (i) (200) plane and (ii) (220) planes.	8	CO1	I
	(b)	How are continuous X-rays produced? Derive an expression for definite minimum wavelength in continuous X-ray spectrum. The radiations of an X-ray tube operated at 50kV are diffracted by a cubic KCl crystal of weight 74.6 and density 1.99×10^3 kg/m³. Calculate the shortest possible wavelength of the spectrum from the tube and glancing angle for first order reflection from the (220) reflecting planes of the crystal for that wavelength	7	CO1	II

3 (a)	Write a short note on HCP structure explaining its unit cell properties. Zinc has an HCP structure. Height of the unit cell is 0.494nm. Atomic weight of zinc is 65.37. Calculate volume of the unit cell and density of zinc.	8	CO1	IV
(b)	Derive relativistic velocity addition formula. Two electrons are ejected in opposite directions from a radioactive material at rest in the laboratory. Each electron has a speed 0.67c as measured by a laboratory observer. What is the speed of one of the electron as measured from the other? Calculate it classically. Also find the velocity measured by an observer moving with one of the electron beams..	7	CO3	V

4
(a) Make a comparison table between electrostatics and magnetostatics. Check which of the following functions an impossible electrostatic field is and which one is an impossible magnetostatic field!

     a. $\overline{E} = k(xy\hat{x} + 2yz\hat{y} + 3xz\hat{z})$

     b. $\overline{E} = k[y^2\hat{x} + (2xy + z^2)\hat{y} + 2yz\hat{z}]$

                8 CO2 V

(b) Write a note on rotating crystal method for determining crystal structures. If the minimum wavelength recorded in an X-ray continuous spectrum of 50kV tube is 24.7×10^{-12}m, calculate Planck's constant.

                7 CO1 II

5
(a) Define magnetic circuit and hence state the similarities and dissimilarities between magnetic circuits and electric circuits. A solenoid consisting of 100turns carrying 10A current is 0.5m long. Calculate (i) magnetomotive force and (ii) total flux if area of cross section is 0.0004m².

                8 CO2 III

(b) Describe the three important plane orientations in a BCC structure. Gold belongs to cubic monoatomic crystal structure. Its density is 19320 kg/m³ and the lattice constant a=4.08A°. Atomic weight is 197. Determine the type of cubic structure to which gold belongs.

                7 CO1 I

6
(a) State and explain with example divergence theorem Compute divergence of the following function:

$$\overline{v_a} = (r\cos\theta)\hat{r} + (r\sin\theta)\hat{\theta} + (r\sin\theta\cos\phi)\hat{\phi}$$

                8 CO2 I

(b) Derive Curie's law from Langevin's theory of paramagnetism. The Curie temperature of iron is 1043K. Calculate the (a) saturation magnetisation (b) Curie constant (c) Weiss field constant assuming there are 10^{28} atoms/m³ having moments of two Bohr magneton per atom.

                7 CO2 IV

7
(a) Derive Galilean transformation equations. A rod has a length of 2m. Find its length when it is carried in a rocket with a speed of 2.7×10^8 m/s.

                8 CO3 V

(b) Explain domain theory using hysteresis curve. A solenoid consisting of 100turns carrying 10A current is 0.5m long. Calculate (i) magnetomotive force and (ii) total flux if area of cross section is 0.0004m².

                7 CO2 III

Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

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Re- Examination
June 2017

Max. Marks:100   Duration: 3 Hrs
Class: F.Y.BTech   Semester: II   Program: Electrical/Mechanical/Civil Engg
Name of the Course: Basic Electrical and Electronics II   Course Code . BT202

Master file.

Instructions:
1. Attempt any 5 questions
2. Assume suitable data if necessary

Qn No		Max Marks	C O No	Mod No.
1	a. Compare Zener and Avalanche breakdown	[10]	CO 1	1
	b. Draw neat circuit diagram and input, output characteristics of a transistor in common base configuration	[10]	CO 1	3
2	a. With neat diagrams explain the operation of SCR as half wave and full wave controlled rectifier	[10]	CO 2	5
	b. With neat diagrams explain the operation of Op-amp as inverting and non inverting amplifier	[10]	CO 2	7
3	a. Explain how NAND and NOR gate act as universal gate	[10]	CO 2	6
	b. Draw neat circuit diagram of bridge rectifier. Explain its working and draw the output waveform.	[10]	CO 2	3
4	a. Draw the circuit diagram and waveform for half wave and full wave rectifier with C and L filter. Also write the expression for ripple factor.	[10]	CO 2	2
	b. Explain the working principle and characteristics of SCR. (Mark all the parameters, also define all the parameters)	[10]	CO 1	5
5	a. Explain single stage CE amplifier with neat diagram. Also draw the input output wave forms	[10]	CO 1	3
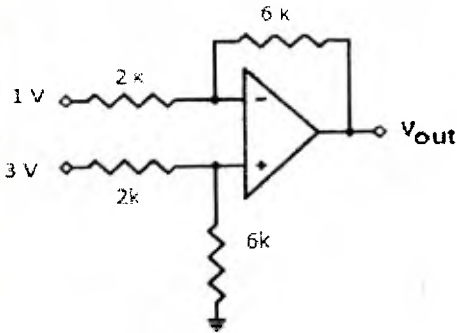
b. Calculate Vout. 	[10]	CO 2	7
a. With neat diagrams explain the operation of Zener diode as a regulator	[10]	CO 2	2

b. Using Boolean algebra techniques, simplify the expression
 	
   1. $X \cdot Y + X(Y + Z) + Y(Y + Z)$
 	
   2. $AB + \overline{AC} + \overline{AB}C(AB + C)$
	[2*5]	CO 1	6

a. Draw the characteristics of JFET and mark all the regions. And also mark all the parameters	[10]	CO 1	4
b. Write short notes on any two	[2*5]		1
1. Photodiode		CO 2	7
2. Op-Amp as voltage follower		CO 2	1
3. LED		CO 1	5
4. Turning off methods for an SCR		CO 1	

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Sardar Patel College of Engineering
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Re-Examination
June 2017

Maximum Marks: 100
Class: F.Y.B.Tech   Semester: II
Name of the Course: **Engineering Mathematics II**

Duration: 3 hours
Program: C/M/E
Course Code : BT201

Instructions:

- Attempt any FIVE questions out of SEVEN questions.
- Answers to all sub questions should be grouped together.

Master file.

Q		Marks	CO	Module
1(a)	Prove that $\int_{0}^{\infty}\dfrac{x^{m-1}}{(1+x)^{m+n}}dx = \beta(m,n)$	6	3	5
(b)	Solve $(D^2+4)y = x\cos x$	6	3	5
(c)	Find the volume bounded by the cylinder $y^2 = x, x^2 = y$ and the planes $z = 0$, $x+y+z = 1$	8	2	3
2 (a)	Assuming the validity of differentiation under integral sign, prove that $\int_{0}^{\pi/2}\dfrac{\log(1+a\sin^2 x)}{\sin^2 x}dx = \pi\left[\sqrt{a+1}-1\right]$.	6	2	7
(b)	Express $\int_{-\pi/4}^{\pi/4} (\sin\theta+\cos\theta)^{1/3}d\theta$ as a beta function.	6	2	6
(c)	Find the area included between the parabola $y^2 = 4x$ and the straight line $2x-3y+4 = 0$	8	1	2
3 (a)	By changing into polar coordinates evaluate $\int_0^4\int_{\sqrt{4x-x^2}}^{\sqrt{16-x^2}}\dfrac{1}{\sqrt{16-x^2-y^2}}dxdy$	6	1	2
(b)	Solve $(D^3-7D-6)y = (x^2-3x+4)e^{2x}$	6	3	5

1

(c)	Evaluate $\int\limits_1^e \int\limits_1^{\log y} \int\limits_1^{e^x} \log z \, dxdydz$	8	2	3
4 (a)	Find the total length of the curve: $x^{\frac{2}{3}} + y^{\frac{2}{3}} = b^{\frac{2}{3}}$	6	1	1
(b)	Solve $(D^2 + a^2)y = \sec ax$	6	3	5
(c)	Evaluate $\iint \dfrac{ye^{2y}}{\sqrt{(1-x)(x-y)}} dxdy$, where R is the region of the triangle whose vertices are $(0, 0)$, $(1, 0)$ and $(1, 1)$.	8	1	2
5 (a)	Solve $\left(2xy^4e^y + 2xy^3 + y\right)dx + \left(x^2y^4e^y - x^2y^2 - 3x\right)dy = 0$	6	3	4
(b)	Evaluate $\iint \dfrac{y}{(a-x)\sqrt{ax-y^2}} dxdy$, where R is the region bounded by $y^2 = ax$ and $y = x$.	6	1	2
(c)	Solve $x^2\dfrac{d^2y}{dx^2} + 5x\dfrac{dy}{dx} + 3y = \left(1+\dfrac{1}{x}\right)^2 \cdot \log x$	8	3	5
6(a)	Prove that $\int\limits_{-1}^1 (1+x)^m(1-x)^n dx = 2^{m+n+1}\beta(m+1, n+1)$. Hence evaluate $\int\limits_{-1}^1 \sqrt{\dfrac{1+x}{1-x}} dx$	6	2	6
(b)	Using DUIS, prove that $\int\limits_0^\infty \dfrac{\log(1+ax^2)}{x^2} dx = \pi\sqrt{a}, \ (a \geq 0)$	6	2	7
(c)	Solve $\dfrac{dy}{dx} = 1 - x(y-x) - x^3(y-x)^2$	8	3	4
7(a)	Find the mass of the lamina bounded by the curves $y^2 = ax$ and $x^2 = ay$ if the density of the lamina at any point varies as the square of its distance from the origin.	6	1	2
(b)	Evaluate $\int\limits_0^1 \sqrt{1-\sqrt{x}}\,dx \cdot \int\limits_0^{1/2} \sqrt{2y-4y^2}\ dy$	6	2	6
(c)	Solve $(D^3 - 3D^2 + 9D - 27)y = \sin 3x$	8	3	5

2

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22|05|2017

Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

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End Semester Examination
May 2017

Max. Marks:100
Class: F.Y.BTech   Semester: II   Duration: 3 Hrs
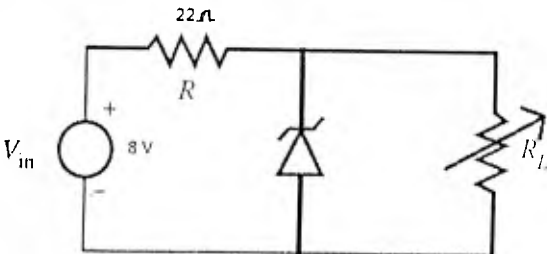Name of the Course: Basic Electrical and Electronics II   Program: Electrical/Mechanical/Civil Engg
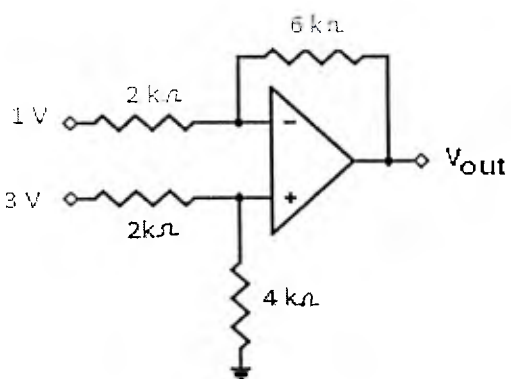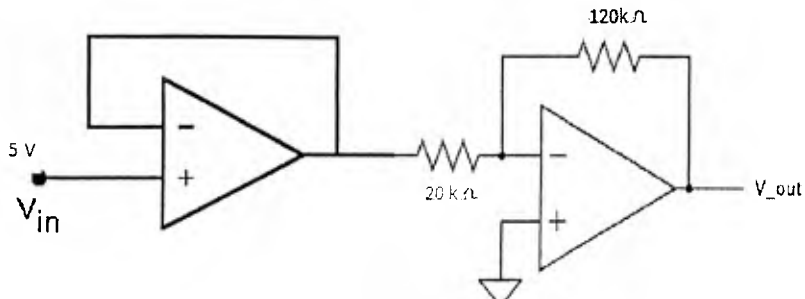Course Code : BT202

Instructions:
1. Question No 1 is compulsory
2. Attempt any 4 questions from Q No.2 to Q.No.7
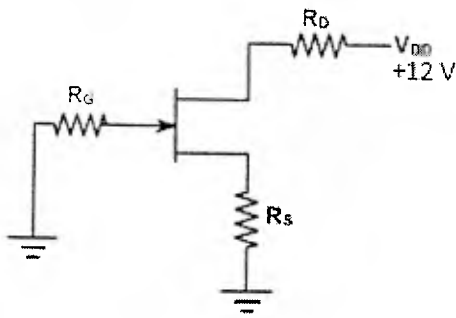3. Assume suitable data if necessary

Master file.

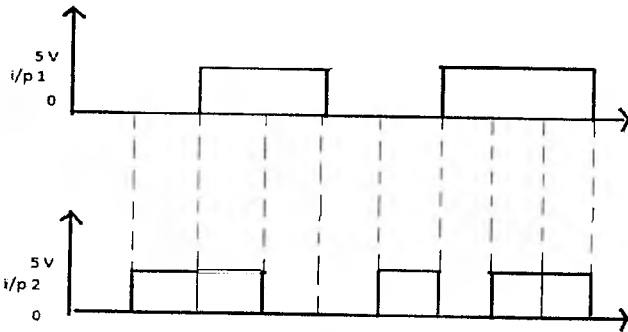| Qn No		Max Marks	C O No	Mod . No
Q1	With neat diagrams explain the operation of			
	a. Zener diode as a regulator	[4*5]	CO 2	2
	b. BJT as a switch		CO 2	3
	c. SCR as a full wave controlled rectifier		CO 2	5
	d. Op-amp as a non inverting amplifier		CO 2	7
Q2	a. Explain the operation of op-amp as an adder and subtractor. Derive the output expressions.	[8]	CO 2	7
	b. A loaded zener regulator is shown in fig. $V_z = 5.1\ V$ at $I_z = 49\ mA$, $I_{ZK} = 1\ mA$, $Z_z = 7\Omega$ and $I_{ZM} = 70\ mA$. Determine minimum and maximum possible load currents. $(R = 22\Omega\ and\ V_{in} = 8V)$	[7]	CO 2	2
	c. What are the turning off methods for an SCR? Explain.	[5]	CO 1	5
Q3	a. Explain the working principle and characteristics of SCR. (Mark all the parameters, also define all the parameters)	[10]	CO 1	5

	b.	Calculate Vout.	[7]	CO2	7
	c.	The device parameters for an n-channel JFET are : Max current $I_{DSS}=$ 10 mA, pinch off voltage $V_P=$ 4 v. Calculate drain current for 1. $V_{GS}=0$ 2. $V_{GS}=-1\ V$ 3. $V_{GS}=-6\ V$	[3]	CO 2	4
Q4	a.	Prove the following using Boolean Algebra 1. $\overline{A}(A+B)+(B+A)(A+\bar{B})=A+B$ 2. $AB+\overline{AC}+A\bar{B}C(AB+C)=1$	[5]	CO 3	6
	b.	Design a circuit diagram of op-amp to give a gain of -15. Explain the same.	[5]	CO 2	7
	c.	Draw a neat diagram of CS amplifier. Also draw the input output waveforms.	[5]	CO 1	4
	d.	A bridge rectifier uses $R_L=$ 1kΩ, each diode is idealized to have $R_f=$ 10Ω. A sinusoidal voltage having amplitude of 60 V is applied. Calculate 1. Peak, dc and rms load currents 2. dc output voltage and dc power 3. ac input power 4. % η	[5]	CO 2	2
Q5	a.	Convert the Boolean expression $Y=\bar{Q}P+R$ into a logic circuit using 1. Only NAND gates 2. Only NOR gates	[10]	CO3	6
	b.	Find the output of the following circuit	[4]	CO 2	7
	c.	Draw the characteristics of JFET and mark all the parameters	[6]	CO 1	4

| Q6 | a. | Find V_{DS} and V_{GS} in fig when I_D=8 mA, R_D=860Ω, R_S =390Ω, R_G=10MΩ and V_{DD}=12 V. | [7] | CO 2 | 4 |

| | b. | Voltage waveforms at two inputs are given below. Determine the output of NAND and EX-OR gates if these inputs are given to each of them. Draw the waveforms. | [4] | CO 3 | 6 |

| | c. | Determine each current in fig. What is β_{DC} ?(Assume $V_{BE} = 0.7\ V$) | [5] | CO 2 | 3 |
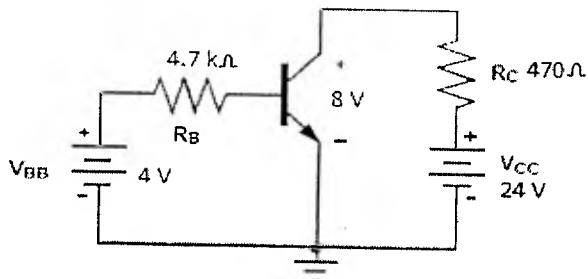
	d.	Draw OR gate using	[4]	CO 3	6
		1. NOR gates			
		2. NAND gates			

Q7	a.	Explain single stage CE amplifier with neat diagram. Also draw the input output wave forms	[10]	CO1	3
	b.	Write short notes on any two	[2*5]		
		1. photodiode		CO 1	1
		2. early effect in transistor		CO 1	3
		3. Avalanche breakdown		CO 2	1