FE (CBSGS) /SEM-II/ C.S. / 19/12/2016.

Q.P. Code : 530304

(2 Hours) **[Total Marks : 40**

N.B. : (1) Question **No.1** is **Compulsory.**
(2) Attempt **any three** out of five questions.

1. (a) "Communication is a circular process". Comment on this statement and mention the steps involved in the communication process. **2**
(b) Identify the sender, message, receiver, medium /channel in the following situation: **2**
The teacher gave clear instruction' to the students regarding how to fill the form.
(c) "Good listening skills are not inherited it can be inculcated". Explain **2**
(d) Give a diagrammatic representation of a letter in modified block format. **2**
(e) Differentiate between caution and warning. **2**

2. (a) "The Face is the index of the mind" Discuss. **2**
(b) Mention the ways to minimize the harmful effects of grapevine communication. **2**
(c) Your shop, Advance Security Services, Marol Road, Andheri has received an enquiry letter from a college regarding prices and installation of 30 CCTV camera. Draft the quotation letter to be sent to the Principal of the college. (Use Complete Block Format) **6**

3. (a) Name and explain any 2 types of Organizational barriers briefly. **2**
(b) Interpret the following gestures: **2**
(i) Frequently playing with tie, buttons or paper weight.
(ii) Arms folded across the chest.
(c) As a Head of an Institution of Technology and Science write a Jetter of complaint to a supplier in Mumbai, demanding the replacement of the consignment of goods not supplied in conformity with the samples approved by you. **6**

4. (a) Identify the barrier: **2**
(i) It was so chaotic outside that I couldn't understand a single word.
(ii) A sign board read, "Fine for parking".
(b) Discuss the paralinguistic aspects of effective communication. **3**
(c) Describe the process of Titration. **3**

TURN OVER

(d) Find one word substitute for the following: 2

(i) Study of colours.

(ii) Receiving and interpreting of received message.

5. (a) Write short notes on :- 3

(i) Haptics (ii) courtesy and consideration

(b) Explain the SQ3R Technique. 2

(c) Match the following: 3

(a)	You attitude	(i)	Salutation
(b)	FB/HR/1 04/07	(ii)	For information
(c)	Greetings to receiver of a letter	(iii)	Principle
(d)	Letterhead	(iv)	Reader's point of view
(e)	Conciseness	(v)	Emblem/logo
(f)	CC to	(vi)	Reference no

(d) Make sentence with the following pair of words so as to differentiate between their meanings: 2

(i) access, excess (ii) eminent, imminent

6. (a) Read the following passage carefully and answer the questions given: 5

One of the greatest advances in modern technology has been the invention of computers. They are widely used in Industries and in Universities. Now there is hardly any sphere of human life where computers have not been pressed in to service of man. We are heading fast on the close of this present century towards a situation when a computer will be as much part of man's daily life as a telephone or a calculator. Computers are capable of doing extremely complicated work in all branches of learning. They can solve the most complex mathematical problems or put thousands of unrelated facts in order. These machines can be put to varied uses. For instance, they can provide information on the best way to prevent traffic, or they can count the number of times the word "and" has been used in the Bible. Because they work accurately and at high speed, they save the research worker's hard work. This whole process by which machines can be used to work for us had been called 'automation'. In the future 'automation' may enable human beings for more leisure than they do today. The coming of automation is bound to have important social consequences. Some years ago an expert on automation, Sir Leon Bagrit,

pointed out that it was a mistake to believe that these machines could 'think'. There is no possibility that human beings will be "controlled by machines". Though computers are capable of learning from their mistakes and improving on their performance, they need detailed instructions from human beings to operate. They can never, as it were, lead independent lives or" rule the world" by making decision of their own. Sir Leon said that in future, computers would be developed which would be small enough to carry in the pocket. Ordinary people would then be able to use them to obtain valuable information. Computers could be plugged into a national network and be used like radios. For instance, people going on holiday could be informed about weather conditions. Car drivers can be given alternative routes when there are traffic jams. It will also be possible to make tiny translating machines. This will enable people who do not share a common language to talk to each other without any difficulty or to read foreign publication. Computers will also be used in ordinary public hospital, by providing a machine with a patient's systems; a doctor will be able to diagnose the nature of illness. Similarly machines could be used to keep a check on a patient's health record and bring it up to date. Doctors will therefore have immediate access to a great many facts which will help in their work. Bookkeepers and accountants too could be relieved of dull clerical work, for the tedious task of compiling and checking lists of figures could be done entirely by machines. Computers will also be able to tell the exact age a man is going to live, with the help of his blood picture. Computers are the most efficient servants man has ever had and there is no limit to the way they can be used to improve our life style and life.

Questions :

1. What is the greatest advancement in modern technology ?
2. Explain Automation.
3. What was the prediction of Sir Leon about the computers in future?
4. Name the areas where computers can be effectively used?
5. Find word in above passage which conveys the similar meaning for
   (i) Difficult or complex
   (ii) Collect or arrange

(b) Describe any ONE of the following objects giving definition, diagram, components & working. 3

(i) portable room cooler (ii) gas stove

(c) Correct the following sentences: 2

(i) He asked me if I ever had been to France

(ii) Every children need love and attention.

FE Sem II (CBGS - ATKT) NOV - DEC 2016

Sub : AM - II

Date : 22/11/2016

Q.P. Code : 529901

3 Hours **Total Marks : 80**

(1) N.B.:- Question no 1 is compulsory.
(2) Attempt any THREE questions out of remaining FIVE questions.

1)a) Solve $\left[\log(x^2+y^2)+\frac{2x^2}{x^2+y^2}\right]dx+\left(\frac{2xy}{x^2+y^2}\right)dy=0$ (4)

b) *Solve* $(D^4+2D^2+1)y=0$ (3)

c) Evaluate $\int_0^\infty e^{-x^5}dx$ (3)

d) Express the following integral in polar co-ordinates: $\int_0^{a/\sqrt{2}}\int_y^{\sqrt{a^2-y^2}} f(x,y)\,dx\,dy$ **(4)**

e) Prove that $E=1+\Delta=e^{hD}$ (3)

f) Evaluate $I=\int_0^{\pi/2}\int_{\pi/2}^{\pi}\cos(x+y)dx\,dy$ **(3)**

2 a) Solve $\frac{dy}{dx}+\frac{y}{x}\log y=\frac{y}{x^2}(\log x)^2$. (6)

b) Change the order of integration and evaluate $I=\int_0^2\int_{\sqrt{2y}}^{y}\frac{x^2\,dx\,dy}{\sqrt{(x^4-4y^2)}}$ (6)

c) Evaluate $\int_0^{\pi/2}\frac{dx}{1+a\sin^2 x}$ and deduce that $\int_0^{\pi/2}\frac{\sin^2 x\,dx}{(3+a\sin^2 x)^2}=\frac{\pi\sqrt{3}}{96}$ **(8)**

3 a) Evaluate $I=\int_0^a\int_0^x\int_0^{x+y}e^{x+y+z}\,dx\,dy\,dz$ (6)

b) If mass per unit area varies as the square of the ordinate of a point, find the mass of a lamina bounded by the cycloid $y=a(1-\cos\theta)$, $x=a(\theta+\sin\theta)$ and the ordinates from the two cusps and the tangents at the vertex (6)

c) Solve $(2x+1)^2\frac{d^2y}{dx^2}-6(2x+1)\frac{dy}{dx}+16y=8(2x-1)^2$ **(8)**

4 a) *Show that the length of the arc of the parabola* $y^2=4ax$ *cut off by the line* $3y=8x$ *is* $a\left[\log 2+\frac{15}{16}\right]$ (6)

b) *Solve* $\frac{d^3y}{dx^3}-7\frac{dy}{dx}-6y=\cos x\cosh x$ (6)

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c) Using fourth order Runge-Kutta method, find u(0.4) of the initial value problem (8)
$u' = -2tu^2$, u(0)=1 take $h = 0.2$.

5 a) Use method of variation of parameters to solve $\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 6y = e^{2x}x^2$. (6)

b) Using Taylor's series method, obtain the solution of $\frac{dy}{dx} = 3x + y^2, y(0) = 1$ (6)

Find the value of y for x = 0.1 correct to four decimal places

c) Find the value of the integral $\int_0^1 \frac{x^2}{1+x^3}dx$ by taking h= 0.2 , using (8)

(i) Trapezoidal Rule (ii) Simpson's 1/3 Rule.

Compare the errors with the exact value of the integral

6 a) A condenser of capacitance C is charged through a resistance R by a steady voltage. The charge Q satisfies the DE $R\frac{dQ}{dt} + \frac{Q}{c} = V$. If the plate is chargeless find the charge and the current at time 't' (6)

b) Evaluate $\iint \frac{(x^2+y^2)^2}{x^2y^2}dxdy$ over the region common to $x^2 + y^2 - ax = 0$ and $x^2 + y^2 - by = 0$, $a > 0, b > 0$? (6)

c) Find the volume common to the right circular cylinder $x^2 + y^2 = a^2$ and $x^2 + z^2 = a^2$ (8)

FE Sem II (CBGS - ATKT) Nov-Dec 2016

Sub: AC-II

Date : 3/12/2016

QP Code : 530104

(2 Hours) **[Total Marks : 60**

N.B. : (1) Question **No.** 1 is compulsory.
(2) Attempt **any three** from remaining **five** questions.
(3) **Figures** to the **right** indicates **full** marks.
(4) Atomic weights : H=1, C=12, N=14, O=16, S=32, Cl = 35.5, Ba= 137.3, Mg =24, Na =23, Ca=40,

1. Answer **any five** from the following :- **15**
   (a) Gold and platinum do not get corroded in atmospheric oxygen. Explain.
   (b) Define octane number of gasoline, Name any two anti-knock agents.
   (c) Give compositions, properties and uses of Duralumin.
   (d) Give classifications of composite material.
   (e) What is green chemistry? List the six principles of green chemistry.
   (f) A coal sample was subjected to ultimate analysis 2.45 g of coal on combustion in a Bomb-Colorimeter gave 0.67 of $BaSO_4$. Calculate percentage of sulphur.

2. (a) How do the following factors affect the rate of corrosion? **6**
   (i) Position of metal in galvanic series.
   (ii) pH of medium
   (iii) Relative areas of anodic and cathodic parts.
   (b) What is Biodiesel? Explain method to obtain biodiesel from vegetable oil. What are the advantages of biodiesel. **5**
   (c) Calculate percentage atom economy for the following reactions with respect to Acetophenone. **4**

$$C_6H_6 + CH_3COCl \xrightarrow{AlCl_3} C_6H_5COCH_3 + HCL$$

Benzene Acetophenone

3. (a) A Gaseons fuel has the following compositions by volume :- **6**
   H= 25%, CO = 20%, CH_4=30% C_3H_8 =20%
   O_2=2% N_2=1%, CO_2= 2% .
   Calculate volume and weighted of air required for complete combustion of 1m³ of fuel (molut of air = 28.949)
   (b) Explain conventional and greener route of synthesis of Adipic Acid. Highlight the green chemistry principle involved. **5**
   (c) Discuss Differential Aeration corrosion with a suitable examples. **4**

[TURN OVER]

4. (a) What is powder -metallurgy? List the various steps involved in powder metallurgy mention the aim of each step. 6
   (b) What is cathodic protection? Describe impressed current method of corrosion control. 5
   (c) Discuss the influence of any two chemical factors on adhesion action. 4

5. (a) What is cracking? Explain in detailed fixed bed catalytic cracking with suitable diagram. 6
   (b) What is an alloy? Explain any four purposes of alloying with suitable examples. 5
   (c) Write a note on ' Sandwich panel' type layered composites. 4

6 (a) What are metallic coatings? Distinguish between galvanizing and Tinning. 5
   (b) Calculate the weight and volume of air needed for complete combustion of 2 kg of coal containing :- 5
   C=54%, H=6.5 %, O=3% , W=1.8%
   mol. wt of air = 28.949).
   (c) Write a note on following :- 5
   (i) Compacting (ii) Sintering

FE Sem II (CBGS) NOV- DEC 2016 . 28/11/2016

Sub : AP- II

Q. P. Code : 530005

(2 Hours) **[Marks : 60]**

N.B. (1) Question no 1 is compulsory.
(2) Attempt any three questions from the remaining questions.
(3) Assume suitable data and symbols if required.
(4) Figures on the right indicate full marks.

1. Attempt any five: **15**
   (a) Why the Newton's rings are circular and fringes in wedge shaped film are straight?
   (b) What is Rayleigh's criteria of resolvation? How to increase resolving power diffraction grating?
   (c) A fibre cable has an acceptance angle of 30° and core index of refractive index 1.4. Calculate the retractive index of cladding.
   (d) What is pumping in Laser? Give the types of puming.
   (e) An electron is bound in one dimensional potential well of width 2.5A° that of infinite height find its energy in first excited state.
   (f) How Lissajous figures are used to measure unknown frequency.
   (g) Why is superconductor is termed as perfect diamagnet?

2. (a) For Newton's ring, prove that diameters of n^{th} dark ring is directly proportional to the square root of natural number. In Newton's ring experiment the diameter of n^{th} and $(n+8)^{th}$ bright rings are 4.2mm and 7mm respectively. Radius of curvature of lower surface of lens is 2m. Determine the wavelength of light used. **08**

   (b) What is monomode and multimode fibre? Explain the term V-number calculate the no of modes an optical fibre of 40 μm will transmit as its core and cladding retractive indigs are 1.5 and 1.46 respectively. Wavelength of light used is 1.5 μm. **07**

3. (a) What is the fundamental principle of a Hologram? How is it produced and how is the image constructed by it ? **08**

   (b) Why we see beautiful colours in thin film when it is exposed to sunlight? Obtain expression for path difference between two reflected rays in thin transparent film of uniform thickness and write the conditions of maxima & minima. **07**

4. (a) What is grating element? Derive condition for absent spectra in plane transmission grating and explain with example. **05**

(b) What is Heisenbregs' uncertainty principle? An electron has a speed of 300 m/ sec. With an accuracy of 0.001%. Calculate the certainty with which we can locate the position of an electron. **05**

(c) What do you mean by critical magnetic field and critical temperature ? A lead superconductor with Tc=7.2k has critical magnetic field of 6.5×10^3 A/ m at absolute zero. What would be the magnitude of critical magnetic field at 5k temperature ? **05**

5. (a) In plane transmission grating the angle of diffraction for the second order principal maxima for the wavelength 5×10^{-5}cm is 35°. Calculate the no. of lines/cm on diffraction grating. **05**

(b) Derive one dimensional time independent Schrodinger wave equation for matter wave. **05**

(c) With neat diagram explain the construction and working of Atomic force Microscope. **05**

6. (a) The electron which is at rest is accelerated through a potential difference of 200V. **05**

Calculate : i) The velocity of electron
ii) De-Brouglie wavelength
iii) Momentum.

(b) Explain how Lissajous figures are used to determine the phase difference between two A.C. signals. **05**

(c) What are nano materials? Explain any two methods for synthesis of Nanoparticles. **05**

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FE Sem II Rev CBGS NOV Dec 2016
(ALL)
Sub: SPA
Date: 13/12/16

QP CODE : 530203

(3 Hours) [Total Marks: 80]

N.B. 1. Q.no.1 is compulsory
2. Attempt any **three** out of the remaining five questions
3. Figures to **right** indicate **full** marks
4. Assume suitable data if necessary but justify the same

Q.1. a. Explain the significance of pointers in C 4
b. What is an algorithm? How do you develop an algorithm? 4
c. Explain the following statement with example:
i. continue ii. break 4
d. Explain any two functions of string.h 4
e. Explain the following functions- floor(), ceil(), trunc(), sqrt() 4

Q.2. a. Write a program to display prime numbers between 1 to 1000 5
b. What is recursion? Write a program to compute fibonacci series using recursion. 5
c. Write a C program to add two distances(feet-inch system) entered by user, using structures 10

Q.3. a. Write a C program to check if the given number is a palindrome or not 6
b. Write a C program to print following pattern 6

E
E D
E D C
E D C B
E D C B A

c. Write a program to calculate sum of digits of a given n digit number using recursion 8

Q. 4 a. Write a program to sort given 10 numbers in ascending order 10

b. Write a program to calculate the sum of following series: 10

(1!/1) + (2!/2) + (3!/3) + (4!/4) + (5!/5) + ... + (n!/n)

Q.5. a. Write a program to compute matrix multiplication and transpose of a matrix 10

b. Write a program to count number of vowels and consonants in a given sentence 10

Q.6. a. Explain the difference between call by value and call by reference with example 8

b. Explain different storage classes 8

c. What is a file? Explain the following file handling functions in c-fopen(), fread(), fwrite() 4

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FE / REV / SEM II / ED / 23-Dec-2016
CBGS

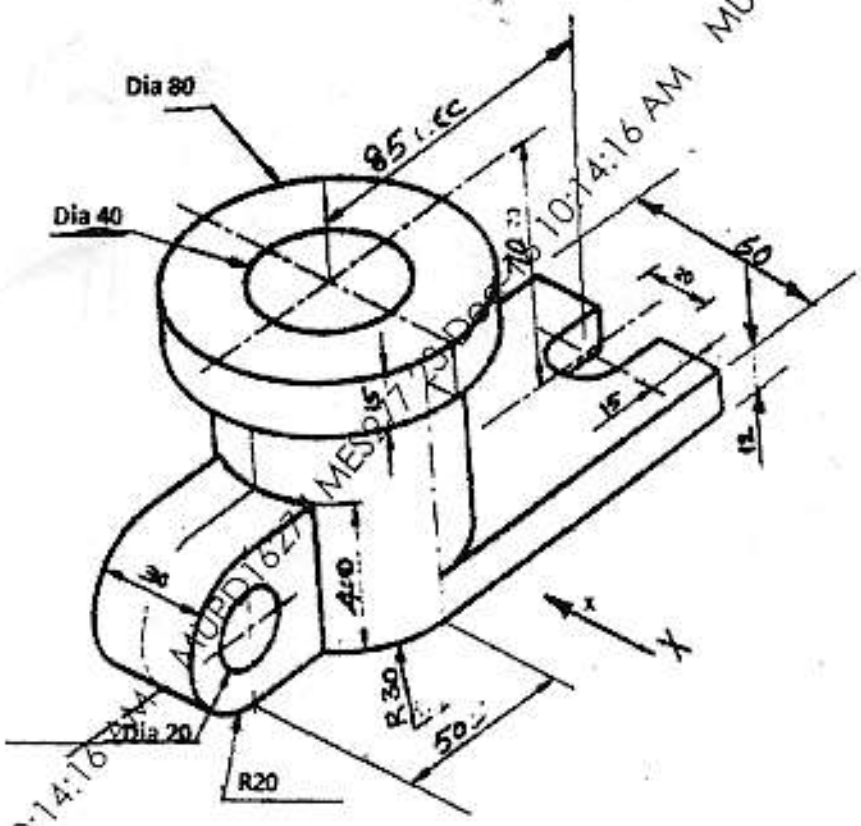
Q.P. Code : 530402

(3 Hours) **[Total Marks: 60**

NB: i) Question one is **Compulsory**. solve any THREE from remaining questions.
ii) All dimensions are in mm.
iii) Use **First angle** method of projection.
iv) Assume suitable dimension if it is necessary.

Q.1 (a) Draw an involute to a circle of diameter 50 mm. Also draw a tangent and Normal to the curve at any point. **[6]**

(b) The pictorial view of a machine part shown in figure. Draw the following views.
i) Front view from X **[4]**
ii) Top view **[5]**

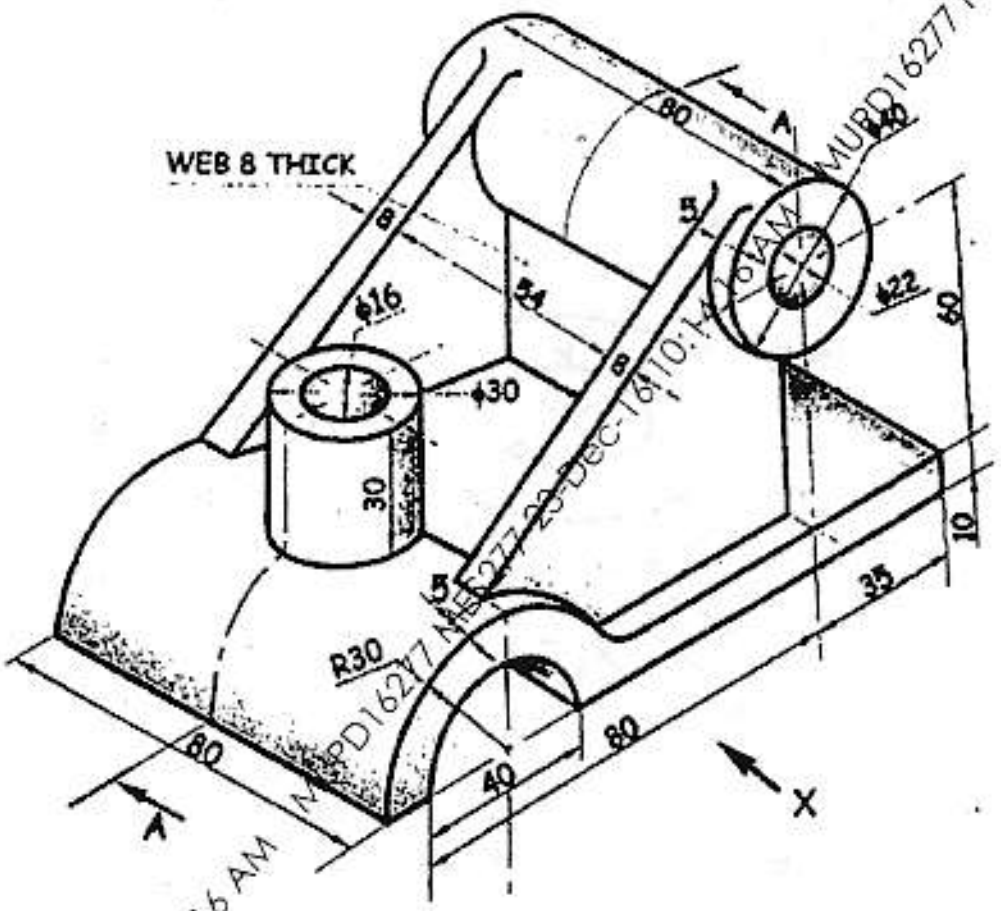


[TURN OVER

Q.2 A right circular cone of diameter 50mm and axis 65mm is lying on HP on one of its end generators. Draw projections on the cone when the plane containing the axis and generator on HP is inclined 45 degrees to VP. **[15]**

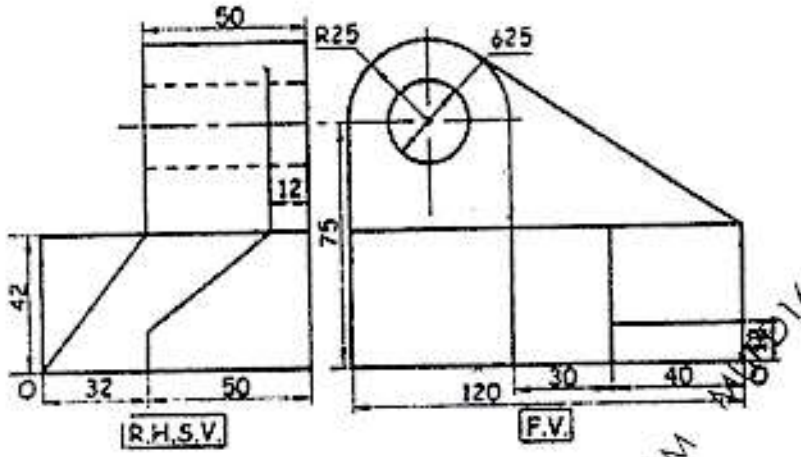
Q.3 The figure shows the pictorial view of an object , draw

i) Sectional front view section along A-A **[5]**
ii) Top view. **[4]**
iii) Left hand Side view **[4]**
iv) Insert major dimensions. **[2]**



Q.4 (a) A square prism of side of base 30m and axis length60mm , is resting on HP on one of its corners with its base making an angle 45° to HP. Draw its projections [6]

(b) Front view and RHS view of an object is shown below. Draw an isometric view of the object. [9]



Q.5 A cone of diameter 60mm and height 75mm is resting on H.P. on its base, it is cut by a section plane inclined to HP and perpendicular to VP such that the true shape of the section is a parabola with axis is equal to 60mm. Draw, [15]

i) Front view (ii) Sectional Top view (iii)True shape of section

ii) Develop the lateral surfaces of the retained portion of the cone after section.

Q.6 (a) The T.V. of a line PQ (True length 90mm) is inclined at 50° to XY while the line is inclined 30 degrees to VP. The end P is 10mm in front of V.P. 20mm above the H.P and the end Q is fourth quadrant. Draw its projections. Determine true inclination of the line with HP. [9]

(b) Front view and Side View of an object are shown in figure, draw an isometric view. [6]