F.E. (C/M/E) sem II.
F.E. (Computer Programming)

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

RE Exam (first half 2015-16)

Sub: Computer Programming   Marks: 100

F.E. (C/M/E) Sem II   Duration: 3 hours

Master dile.

- Attempt any FIVE out of SEVEN questions.
- Figures to the right indicate full marks.
- Assume suitable data wherever necessary.

1. Explain the following with an example   20

    i.   If- else statement

    ii.   switch statement

    iii.   do – while loop

    iv.   for loop

    v.   while loop

2. a. Write a program to add 1ˢᵗ 100 natural numbers using function   10

    b. Write a short note on Datatypes supported by C++   10

3. a. Explain Passing by reference and passing by value with examples   10

    b. Explain the concept of local and global variables with an example.   10

4. a. Write a menu driven program to do addition, subtraction, multiplication or division   10
        of two numbers.

    b. Write a program to check whether the entered string is palindrome or not without .   10
        using strrev() function.

(1)

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5. a. Write a program to add to private data members of two separate classes using Friend function. 10

    b. Explain multilevel inheritance with an example 10

6. a. Short note on Features of Object oriented programming 10

    b. Explain Function overloading with an example 10

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    b. Write an algorithm and draw a flow chart to divide two numbers 10

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Lib —Re-Exam
08-01-16

BHARATIYA VIDYA BHAVAN'S
SARDAR PATEL COLLEGE OF ENGINEERING
Munshi Nagar,Andheri(West),Mumbai 400 058
(A Government Aided Autonomous Institute)
RE-Exam-Jan 2016

Duration: 3 hours   Marks: 100

Subject: **BASIC ELECTRICAL AND ELECTRONICS ENGINEERING II**

Class/Branch: FE- (C/M/E)   Semester: II

Master file .

Note:

Question no 1 is compulsory
Answer any 4 of the remaining 6 questions
Assume suitable data if required.
Figures to right indicate full marks.
Answers to all sub-questions should be grouped together.

1	a	Explain in brief avalanche breakdown and zener breakdown in PN junction diode	5
	b	Explain BJT as a switch.	5
	c	Write short notes on LEDs	5
	d	Define current gains in CB and CE configurations. Explain how the current gains are related to each other.	5
2	a	Explain with neat diagram the working of bridge rectifier and derive an expression for transformer utilization factor.	10
	b	Explain the input and output characteristics of BJT in common emitter mode.	10
3	a	Explain the working principle and Characteristics of SCR .	10
	b	Explain in detail a single stage CE Amplifier with the neat diagram.	10
4	a	Explain universal gates.	12
	b	Explain the operation of a full wave rectifier with 'C' filter along with neat circuit diagrams and waveforms.	8
5	a	Write short notes on photodiodes.	6
	b	Explain two transistor analogy of an SCR.	8

①

F. E. (C/M/E) sem II
Basic Electrical & Electronics Engg. - II -

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Munshi Nagar, Andheri(West), Mumbai 400 058

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RE-Exam-Jan 2016

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c Convert the boolean expression **Y=AB+C** into a logic circuit using   6
   1. Only NAND gates
   2. Only NOR gates

6 a Compare half wave and full wave rectifier: 10

Parameters	Half Wave Rectifier	Center tapped FWR	Bridge FWR
Vdc			
V_{RMS}			
Rectification Efficiency(η)			
Ripple factor			
PIV			
Ripple frequency			

b Explain the characteristics and parameters of JFET.   10

7 a Derive the expression for the voltage gain of an op-amp as inverting amplifier..   6
   b Explain the operation of OPAMP as an adder and subtractor   8
   c Explain the operation of a Zener diode as a voltage regulator with its   6
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Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

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ENGINEERING MECHANICS - II

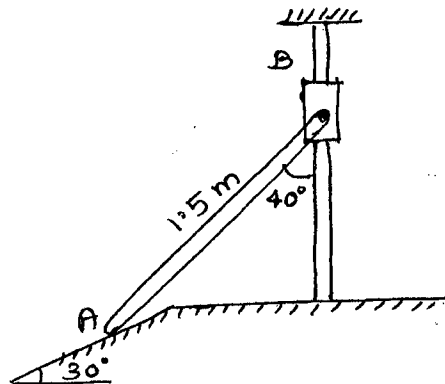Duration : 3 Hours   (100 MARKS)   FE (C/M/E) SEM II

Master file.

- Attempt any FIVE questions out of remaining SEVEN questions.
- Assume any other data needed suitably if not given; but justify the same.
- Illustrate your answers with neat sketches wherever required, though not sought specifically.

Q1.a. A car starts from rest and travels on a straight road with a constant acceleration of $1.2 \ m/s^2$. After some time a scooter passes by it travelling in the opposite direction with a uniform velocity of 36 kmph. The scooter reaches the starting position of the car 30 sec after car had left from there. Determine when and where the two vehicles passed each other.   10
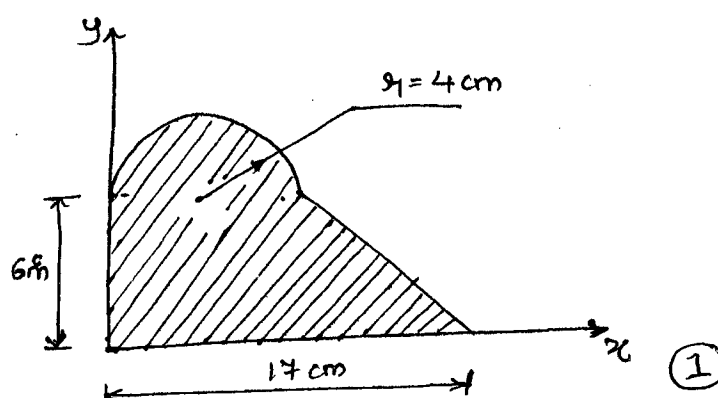
b. A motorist travelling at a speed of 90 kmph suddenly applies the brakes and comes to rest after skidding 100 m .Determine the time required for the car to stop and coefficient of friction between the tyres and the road.   10

Q2.a. A block of mass of 50 kg is placed on a plane inclined at 30° with the horizontal. A horizontal force of 250 N acts on the block tending to move the block down the plane. Determine its velocity 4 sec after starting from rest. Take $\mu = 0.3$.   10

b.

Figure shows a collar B which moves up with constant velocity of 2 m/s. To the collar is pinned a rod AB, the end A of which slides freely against at 30° sloping ground. For this instant, determine the angular velocity of the rod and velocity of end A of the rod.   10

Q3.a. Find the centroid of the shaded area shown.   10

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ENGINEERING MECHANICS - II

Duration : 3 Hours   **(100 MARKS)**   FE (C/M/E) SEM II
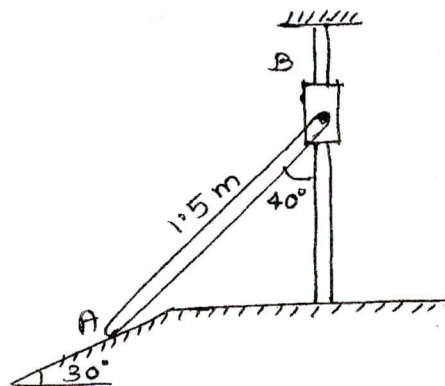
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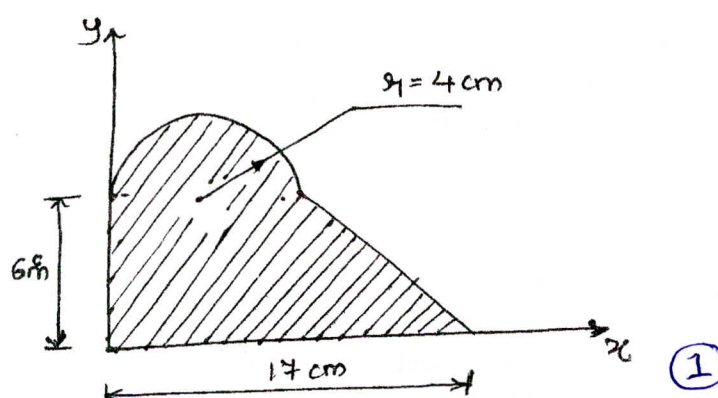
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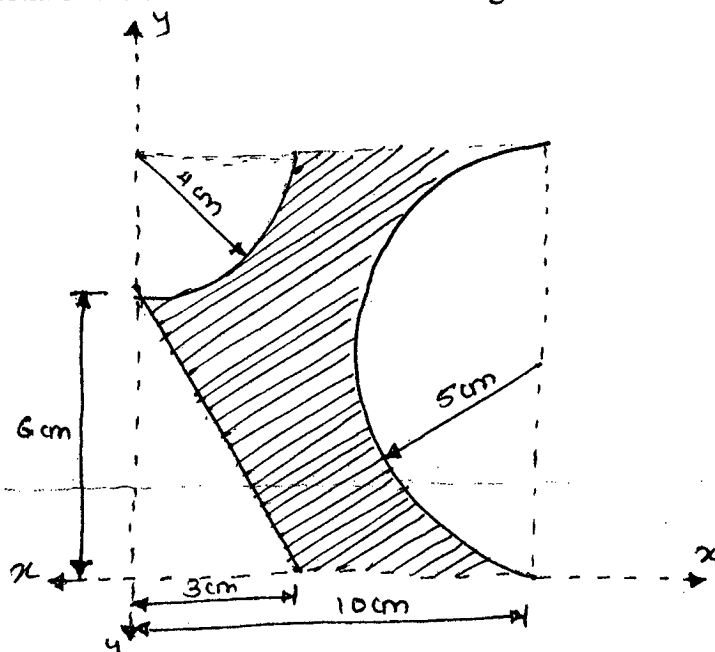

Q3.a.   Find the centroid of the shaded area shown.   10

b.   Find moment of inertia of the shaded area shown in the figure about x axis and y axis.   10

Q4.a.   A 2 kg ball moving with 0.4 m/s towards right collides head on with another balls of mass 3 kg, moving with 0.5 m/s towards left. Determine the velocities of the balls after impact and the corresponding percentage loss of kinetic energy when (i) the impact is perfectly elastic (ii) the impact is perfectly plastic.   12
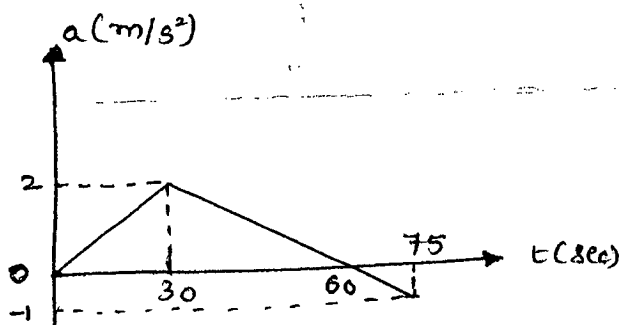
b.   The acceleration of a particle performing rectilinear motion is given by $a = k.t^2$ m/s2. It is found that v = -24 m/s when t = 0 and v = 48 m/s when t = 4 sec. Also x = 0 at t = 3 sec. Find the value of k and also the position, velocity and acceleration of the particle at t = 2 sec.   8

Q5.a.   Figure shows (a - t) diagram for particle moving along a straight path for a time interval 0-75 sec. Plot (v-t) and (x-t) diagrams and hence find the maximum speed attained by the particle. The particle started from rest from origin.   14

b.   Explain the importance of Centroid and Moment of Inertia.   6

Q6.a.   A wheel has an angular acceleration given by the relation α 36 - 4 rad/s² . If ω = 4 rad/s at t = 0, find   12
a) the maximum angular velocity and the corresponding time.
b) the total time taken for it to come to rest.
c) the total number of revolutions executed by the wheel.
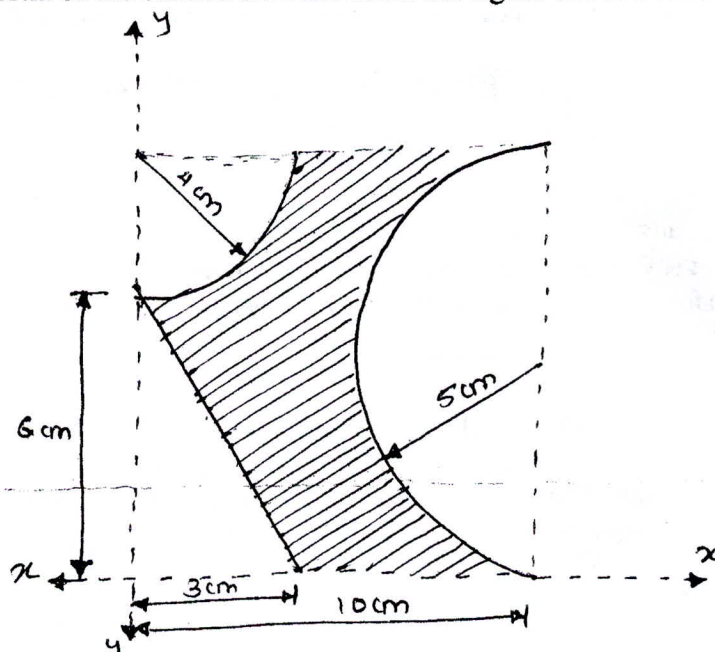
b.   Explain Instantaneous Centre of Rotation (ICR).   4

c.   Distinguish between Centre of Gravity and Centroid.   4

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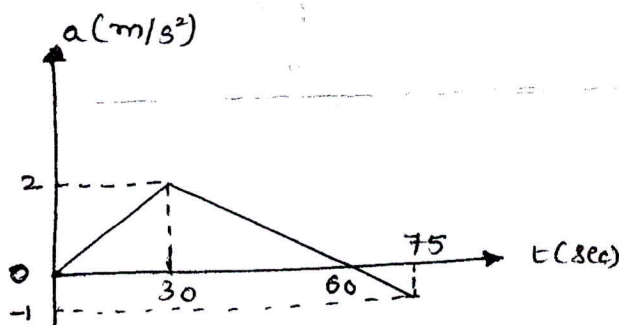
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Q7.a. From the top of a building 20 m high a ball is projected at 15 m/s at an angle at 30° upwards to the horizontal. At what distance it would hit the ground from the foot of the building. What is the maximum height attained above the ground, the velocity of the ball just as it hits the ground and the total time of flight.　　　　10

b. Two blocks A and B are held stationery 10m apart on a 20° inclined plane as shown. The kinetic coefficient of friction between A and plane is 0.3 and between B and plane is 0.1. If the blocks are released simultaneously, calculate the time taken and distance travelled by each block before they are on the verge of collision　　　　10

✻　✻　✻　✻　✻

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BHARATIYA VIDYA BHAVAN'S
SARDAR PATEL COLLEGE OF ENGINEERING
GOVERNMENT AIDED AUTONOMOUS INSTITUTE
ANDHERI (WEST), MUMBAI - 400 058.
ATKT Exam
January 2016

Lib - Re-Exam
04-01-16

Max. Marks: **100**   Duration: **3 hours**

Class: **F.Y.B.Tech**   Semester: **II**   Program: **C/M/E**

Name of the Course: **Engineering Mathematics - II**   Course Code : **BT201**

Master file.

Instructions:
1. Question No 1 is compulsory.
2. Attempt any four questions out of remaining six.
3. Answers to all sub questions should be grouped together.
4. Assume suitable data if necessary.

Q. No		Maximum Marks
Q1(a)	Solve $(y - 2x^3)dx - x(1 - xy)dy = 0$	6
(b)	Evaluate $\int_0^{\log 2} \int_0^x \int_0^{x+y} e^{x+y+z} dxdydz$	6
(c)	Solve $(D^3 + 1)y = (e^{-x} + 1)^2$	8
Q2(a)	Change to polar coordinate and evaluate $\int_0^{2a} \int_0^{\sqrt{2ax-x^2}} (x^2 + y^2)dxdy$	6
(b)	Solve $\left(1 + e^{x/y}\right)dx + e^{x/y}\left(1 - \frac{x}{y}\right)dy = 0$	6
(c)	Find the area included between the parabola $y = x^2 - 6x + 3$ and the straight line $y = 2x - 9$	8
Q3(a)	Find the volume bounded by the cylinder $y^2 = x, x^2 = y$ and the planes $z = 0$, $z = 3$	6
(b)	Solve $(D^3 - 7D - 6)y = (x^2 - 3x + 4)e^{2x}$	6
(c)	Prove that $\int_0^\infty \frac{e^{-x^3}}{\sqrt{x}}dx \cdot \int_0^\infty y^4 e^{-y^6} dy = \frac{\pi}{9}$	8
Q4(a)	Solve $(D^2 + 3D + 2)y = e^{e^x}$	6
(b)	Find the length of the arc of the parabola $y^2 = 6x$ cut off by its latus rectum	6
(c)	Solve $(x+1)^2 \frac{d^2y}{dx^2} - (x+1)\frac{dy}{dx} + y = 2x + 3$	

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F.Y.B.Tech. Sem-II - C/M/E.
Engineering Mathematics -II

Lib - Re-Exam
04-01-16

BHARATIYA VIDYA BHAVAN'S
SARDAR PATEL COLLEGE OF ENGINEERING
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Q5(a) Evaluate $\int\limits_{0}^{1}\int\limits_{0}^{\sqrt{1-x^2}}\int\limits_{0}^{\sqrt{1-x^2-y^2}}\dfrac{1}{\sqrt{1-x^2-y^2-z^2}}dxdydz$ **6**

(b) Change the order of integration $\int\limits_{0}^{1}\int\limits_{x}^{1+\sqrt{1-x^2}}f(x,y)dxdy$ **6**

(c) Find the length of the loop of the curve $9ay^2 = (x-2a)(x-5a)^2$.   **8**

Q6(a) Solve $\left(D^2 - 6D + 9\right)y = \sin 3x$ **6**

(b) Prove that $\int\limits_{0}^{\pi/2}\tan^n x\,dx = \dfrac{\pi}{2}\sec\left(\dfrac{\pi n}{2}\right)$ **6**

(c) Solve $\dfrac{dy}{dx} + x^3\sin^2 y + x\sin 2y = x^3$ **8**

Q7(a) Solve $(D^2 + a^2)y = \tan ax$ **6**

(b) Evaluate $\iint\limits_{R} e^{ax+by}dxdy$ where R is the region bounded by the straight lines.   **6**

$x=0,\ y=0$ and $ax+by=1$

(c) Using DUIS, prove that $\int\limits_{0}^{\infty}\dfrac{\log(1+ax^2)}{x^2}dx = \pi\sqrt{a},(a>0)$ **8**

②

Q5(a) Evaluate $\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} \dfrac{1}{\sqrt{1-x^2-y^2-z^2}} dx\,dy\,dz$ **6**

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2

Bharatiya Vidya Bhavan's
Sardar Patel College of Engineering
(A Government Aided Autonomous Institute)
Munshi Nagar, Andheri (West), Mumbai – 400058.
Re- Exam

F.Y. B.Tech (CIM/E) sem II
Applied Chemistry-II dt.6.1.16

Max. Marks: 75
Class: F.Y.B.Tech.
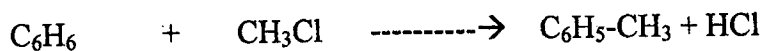Name of the Course: **Applied chemistry-II**

Duration: **3.00 Hrs**
Semester: II
Course Code : **BT-206**

Instructions:
1. All questions are compulsory
2. Draw neat diagrams

Master File

Question No.		Maximum Marks
Q1 (a)	Write note on anodic protection method and its advantages	05
(b)	Explain Factor affecting rate of corrosion	05
(c)	Write difference between Dry corrosion and Wet corrosion	05
Q2 (a)	Write advantages and disadvantages of powder metallurgy	05
(b)	Write composition, properties and use of German silver alloy	05
(c)	Write applications of composite materials	05
Q3 (a)	Define Propellant Explain characteristics of good Propellant	05
(b)	Write units of calorific value	05
(c)	Write short note on cracking	05
Q4 (a)	Write short note on Octane number	05
(b)	Write short note on Biodiesel with its advantages	05
(c)	Explain characteristics properties of composite materials	05
Q5 (a)	Describe principals of green chemistry	05
(b)	Write Note on Atom economy with suitable example	05
(c)	Calculate the % atom economy for following reaction	05

$$C_6H_6 \quad + \quad CH_3Cl \quad \text{---------} \rightarrow \quad C_6H_5\text{-}CH_3 + HCl$$

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Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)

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

Re- Exam

Max. Marks: 75

Class: **F.Y.B.Tech.**

F.Y.B.Tech (CIM/E) sem II
Applied Chemistry-II dt.6.1.16

Duration: **3.00 Hrs**

Semester: II

Course Code : **BT-206**

Name of the Course: **Applied chemistry-II**

Master File

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(b)	Write Note on Atom economy with suitable example	05
(c)	Calculate the % atom economy for following reaction	05

$$C_6H_6 \quad + \quad CH_3Cl \quad \text{---------} \rightarrow \quad C_6H_5\text{-}CH_3 + HCl$$