

SF - 985

Seat No.	
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Total No. of Pages : 2

**B.E. (F.E.) (All Branches) (Semester - I & II) Examination,
November - 2017**

BASIC MECHANICAL ENGINEERING

Sub. Code : 59186

Day and Date : Friday, 24 - 11 - 2017

Total Marks : 100

Time : 02.30 p.m. to 05.30 p.m.

- Instructions:**
- 1) Attempt any three questions from each section.
 - 2) Figures to right indicates full marks.
 - 3) Assume any additional data if required and mention it clearly.

SECTION - I

- Q1) a)** Define thermodynamic state, thermodynamic process and thermodynamic cycle. [6]
- b)** Explain Kelvin Planck Statement and Clausius statement of second law of thermodynamics. [4]
- c)** In centrifugal compressor the suction and delivery pressure are 100 Kpa and 550 Kpa respectively. The compressor draws 15 m³/min of air which has specific volume of 0.77 m³/Kg. At delivery point the specific volume is 0.20 m³/Kg. The compressor is driven by a 40 Kw motor and during passage of air through the compressor the heat loss to the surroundings is 30 KJ/Kg of air. Neglecting changes in potential energy and kinetic energy calculate increase in internal energy per kg of air. [6]
- Q2) a)** What are similarities and dissimilarities between heat and work? [6]
- b)** What is statement of first law of thermodynamics and state its limitations. [6]
- c)** Steady flow process is applied to nozzle. Steam enters horizontally at a pressure of 10 bar. The pressure of steam at the exit of the nozzle is 1 bar. The internal energy of the steam decreases by 250 KJ/Kg and specific volume increase from 0.2 m³/Kg to 1.7 m³/Kg as the steam flows through the nozzle. Find the exit velocity of steam if its inlet velocity is 900 m/min. Heat transferred from nozzle is negligible. [6]



P.T.O.

- Q3)** a) Compare two stroke and four stroke I.C. Engine. [8]
 b) Derive an expression for air standard efficiency for Otto cycle. Explain that the efficiency of an air standard Otto cycle is a function of compression ratio only. [8]
- Q4)** a) Differentiate between Vapour compression refrigeration and Vapour absorption refrigeration. [4]
 b) Define following terms : [4]
 i) Dew point temperature
 ii) Relative humidity
 iii) Wet bulb temperature
 iv) Dry bulb temperature
 c) Explain with neat sketch Vapour absorption refrigeration system. [8]

SECTION - II

- Q5)** a) Explain with neat sketch construction and working of Geothermal power plant. [8]
 b) Explain axial flow compressor with neat sketch. [8]
- Q6)** a) Two pulleys having diameter 2 m and 1.5 m are separated by a distance of 5 m. The initial tension in the belt is 3 KN. The coefficient of friction between the belt and pulley is 0.3. Calculate the power transmitted by open belt when a smaller pulley rotates at 200 r.p.m. Neglect centrifugal tension. [8]
 b) Explain with neat sketch working of Photovoltaic cell. [8]
- Q7)** a) Explain manufacturing process. Define metal removing process. Explain any one. [8]
 b) Enlist different metal joining processes. Explain brazing process. [8]
- Q8)** Write short note on : [18]
 a) Solar collector
 b) Centrifugal pump
 c) Sand casting process

SF - 5

Total No. of Pages :2

Seat No.	
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F.E. (All Branches) (Part - I) (Semester - I & II) (Revised)
Examination, November - 2017
FUNDAMENTALS OF ELECTRONICS AND COMPUTERS
Sub. Code: 59184

Day and Date :Saturday, 11 - 11 - 2017

Total Marks : 100

Time :2.30 p.m. to 5.30 p.m.

- Instructions :
- 1) All questions are compulsory.
 - 2) Figures to right indicate full marks.
 - 3) Assume suitable data if necessary.

SECTION - I

Q1) Solve any two : [18]

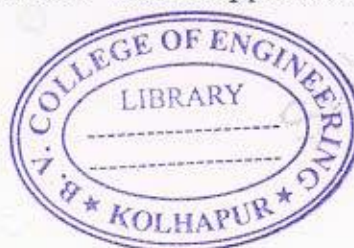
- a) Explain HW rectifier with necessary waveforms.
- b) What is flip-flop? Explain J-K flip-flop.
- c) Write a short note on mobile handset with block diagram.

Q2) Solve any two : [16]

- a) Explain how transistor operates in CB configuration? Explain with I/P and O/P characteristics.
- b) What is De-multiplexer? Explain 1 :4De-mux with truth table
- c) Explain washing machine with block diagram.

Q3) Solve any two : [16]

- a) Explain fixed bias circuit for biasing of transistor. Derive expression for stability factor.
- b) Mention names of logic families and explain any one in detail.
- c) Explain in details thermistor transducer with an application.



P.T.O.

SECTION - II

Q4) Solve any two :

[18]

- a) What are different hardware component of a computer system. Explain any four of them.
- b) What is operating system? Explain different types of OS.
- c) Write short note on computer network.

Q5) Solve any two :

[16]

- a) List and explain different topologies of computer network.
- b) Explain output devices of computer system.
- c) Explain following UNIX/LINUX command with an example.
 - i) LS.
 - ii) CD.
 - iii) CAT.
 - iv) MKDIR.
 - v) PWD.
 - vi) CP.

Q6) Solve any two :

[16]

- a) Explain OSI model.
- b) Explain in brief Assembler, interpreter and compiler.
- c) Explain low level language and high level language in details.



Seat
No.

F.E. (All Branches) (Part - II) (Semester - I & II) (New)

Examination, November - 2017

ENGINEERING MATHEMATICS-II

Sub. Code : 59933

Day and Date : Wednesday, 01 - 11 - 2017

Total Marks : 100

Time : 2.30 p.m. to 5.30 p.m.

- Instructions :
- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Use of non-programmable calculator is allowed.

SECTION - I

Q1) Solve any THREE from the following: (5 marks each).

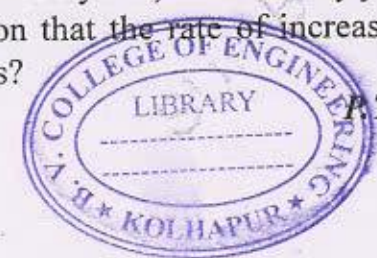
[15]

- a) $(1+x^2)\frac{dy}{dx} + 2xy - 4x^2 = 0$
- b) $\left[y\left(1 + \frac{1}{x}\right) + \cos y \right] dx + [x + \log x - x \sin y] dy = 0$
- c) $(x^3 y^2 + xy) dx = dy$
- d) $(x^2 y - 2xy^2) dx - (x^3 - 3x^2 y) dy = 0$

Q2) Attempt any THREE from the following: (5 marks each).

[15]

- a) Find orthogonal trajectories of the family of curves $x^2 + y^2 = 2ax$, where a is parameter.
- b) A 12 V battery is connected to a simple series circuit in which the inductance is $\frac{1}{2}$ H and resistance is 10Ω determine the current i if $i(0) = 0$.
- c) A body originally at 85°C cools to 65°C in 25 minutes the temperature of air being 40°C , what will be the temperature of the body after 40 minutes.
- d) If the population of a country is doubles in 50 years, in how many years will it three times under the assumption that the rate of increase is proportional to the number of inhabitants?



SF-1

Q3) Attempt any FOUR from the following: (5 marks each). [20]

- a) Using Euler's method find the approximate value of y when $x = 1.5$ given $\frac{dy}{dx} = \frac{y-x}{\sqrt{xy}}$ and $y(1) = 2$. Take $h = 0.1$
- b) Use Euler's modified method to find the value of y satisfying the equation $\frac{dy}{dx} = -xy^2$ with $y(0) = 2$ for $x = 0.2$
- c) Use Taylor's series to solve numerically $\frac{dy}{dx} = 3x + y^2$. Given that $y(0) = 1$ at $x = 0.1$.
- d) Apply Runge-Kutta fourth order formula to solve the differential equation $\frac{dy}{dx} = \sqrt{\sin x + \cos y}$, $y(0) = 1$ at $x = 1.5$
- e) Solve the following simultaneous differential equations by Runge-Kutta method fourth order $\frac{dy}{dx} = xz + 1$, $\frac{dz}{dx} = -xy$ for $x = 0.3$ given that $y = 0$, $z = 1$, when $x = 0$.

SECTION - II

Q4) Attempt any THREE from the following: (5 marks each). [15]

- a) Evaluate $\int_0^\infty x^7 e^{-2x^2} dx$.
- b) Evaluate $\int_0^\infty \frac{x^4(1+x^5)}{(1+x)^{15}} dx$.
- c) Prove that $\int_0^\infty \frac{e^{-\alpha x} \sin x}{x} dx = \cot^{-1} \alpha$ and hence deduce that $\int_0^\infty \frac{\sin x}{x} dx = \frac{\pi}{2}$.
- d) Define Error function and hence prove that $\operatorname{erf}(\infty) = 1$.

SF-1

Q5) Attempt any THREE from the following: (5 marks each). [15]

- a) Trace the Strophoid curve $y^2(a+x) = x^2(a-x)$ where $a > 0$.
- b) Trace the Lemniscate curve $r^2 = a^2 \cos 2\theta$.
- c) Find the length of the arc of $y^2 = 4x$ cut off by the line $3y = 8x$.
- d) Show that the length of arc of that part of cardioid $r = a(1 + \cos \theta)$ which lies on the side of the line $4r = 3a \sec \theta$ away from the pole is $4a$.

Q6) Attempt any FOUR from the following: (5 marks each). [20]

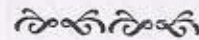
- a) Evaluate $\int_1^2 dx \int_1^3 xy^2 dy$
- b) Evaluate $\int_0^{\pi/2} \int_0^y \cos 2y \sqrt{1 - a^2 \sin^2 x} dx dy$
- c) Change into polar co-ordinates and hence evaluate $\int_0^a \int_y^a \frac{x^2}{(x^2 + y^2)^{3/2}} dx dy$.
- d) Find by double integration the area lying between the cardioid $r = a(1 + \cos \theta)$ and outside the circle $r = a$.
- e) ABCD is a square plate of side a and o is the midpoint of AB. If the surface density is proportional to the square of the distance from o , show that the center of gravity of the plate is at a distance $\frac{7}{10}a$ from AB.



SF - 7

- b) A 2000N block is in contact with level plane; coefficient of friction is 0.30, if the block is acted upon horizontal force 650 N. What time elapse before the block reaches a velocity of 10 m/s starting from rest? If 650 N force is then removed how much longer will the block continue to move solve by using impulse-momentum principle. [12]

- 26) a) Explain motion under gravity. [3]
 b) Explain coefficient of restitution. [3]
 c) A ball dropped from height of 2 m on a smooth floor. The height of the first bounce is 1.62m. Determine
 i) coefficient of restitution and
 ii) expected height of next bounce. [10]



SF - 7

Total No. of Pages :4

Seat No.	
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F.E. (All Branches) (Semester - I & II) (New)
Examination, November - 2017
APPLIED MECHANICS
Sub. Code: 59185

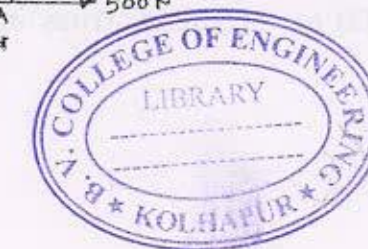
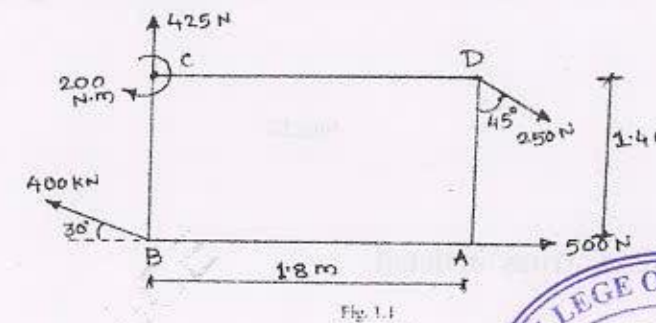
Day and Date : Monday, 20 - 11 - 2017
 Time : 2.30 p.m. to 5.30 p.m.

Total Marks : 100

- Instructions :
- 1) All the questions are compulsory.
 - 2) Figures to the right indicate maximum marks for the question.
 - 3) Neat sketches should be drawn whenever necessary.
 - 4) Use of Non-Programmable calculator is allowed.
 - 5) Any missing data may be assumed suitably and clearly highlighted in the answer sheet.

SECTION-I

- Q1) a) Explain:-
 i) Resolution of forces [4]
 ii) Couple
 b) Find resultant for the force system shown in figure and locate it with respect to 'A' [12]



P.T.O.

SF - 7

Q2) a) State and explain virtual work principle. [5]

b) The cylindrical rollers of weight 50 N each are placed inside a cup. Find the reactions at the point of contact. Refer fig. 2.1 [13]

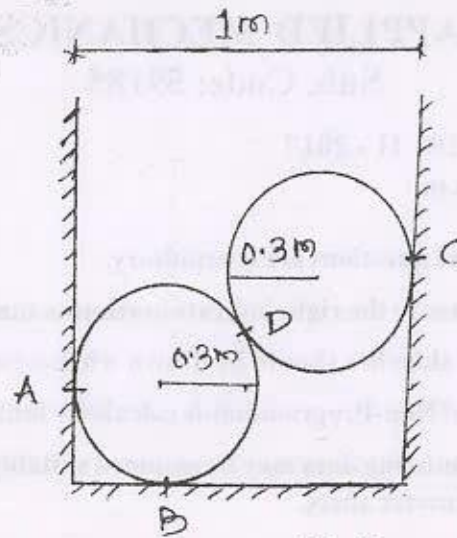


Fig. 2.1

OR

b) Determine the support reaction for the beam shown in fig. 2.2 by using Virtual work principle. [13]

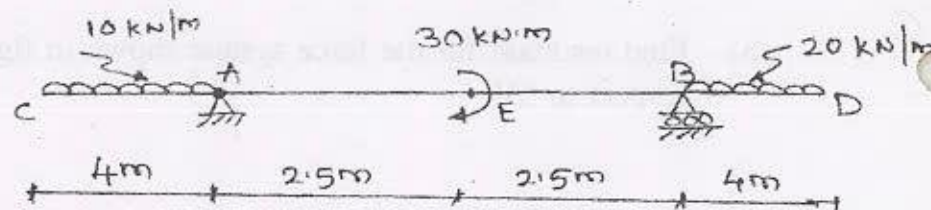


Fig. 2.2

Q3) a) Explain 'Truss' in detail. [4]

SF - 7

b) Determine the forces in all the members of a truss shown in fig. 3.1. [12]

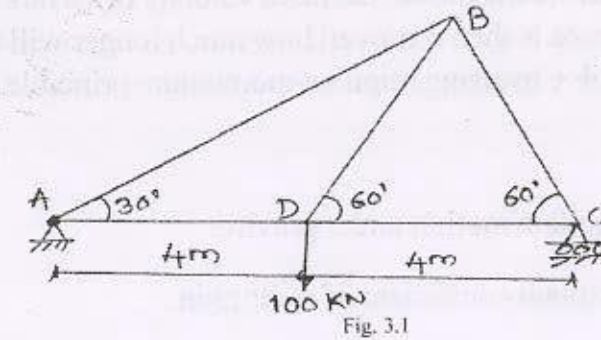


Fig. 3.1

SECTION-II

Q4) a) State and prove parallel axis theorem. [4]

b) Find the moment of inertia for the shaded area about centroidal both mutually perpendicular axes. Refer fig 4.1. [12]

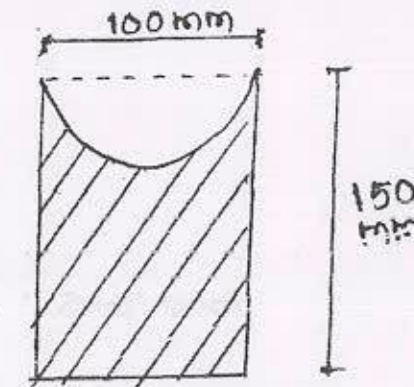


Fig. 4.1

Q5) a) Explain S-t, V-t and a-t curves. [6]

b) An elevator cage of mine shaft weighing 15 kN when empty is lifted or lowered by means of wire rope. Once man weighing 900 N entered in it and moving down with uniform acceleration such that when distance of 250 m was covered. The velocity of the cage 30 m/s. Determine the tension in the rope and force exerted by the man on the floor of the cage. [12]

OR

SF-9
[15]

16) Attempt any three of the following.

- Solve the following equations by Gauss-Jordan method
 $x + y + z = 5; 2x + 3y + z = 10; 3x - 2y + 2z = 3.$
- Use Jacobi's iteration method (Three iterations only) to solve
 $5x + 2y + z = 12; x + 4y + 2z = 15; x + 2y + 5z = 20.$
- Use Gauss-Seidal method (03 iterations) to solve the equations
 $x + 7y - 3z = (-22); 5x - 2y + 3z = 18; 2x - y + 6z = 22.$

- Find the largest eigen value of matrix $A = \begin{bmatrix} 1 & 6 & 1 \\ 1 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix}$ by Rayleigh's power

method with $x = \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix}$ as a base vector.



SF-9

Total No. of Pages : 4

at

F.E. (All Branches) (Part-I) (Semester-I & II) (Revised)

Examination, November - 2017

ENGINEERING MATHEMATICS-I

Sub. Code : 59177

Total Marks : 100

Day and Date : Monday, 27-11-2017

Time : 2.30 p.m. to 5.30 p.m.

- Instructions :
- All the questions are compulsory.
 - Figures to the right indicate full marks.
 - Use of non-programmable calculator is allowed.

SECTION-I

Q1) Attempt any three of the following.

[15]

- Find non-singular matrices P and Q such that PAQ is in the normal form

and hence find rank of A where $A = \begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 1 & 4 & 3 \\ 3 & 0 & 5 & -10 \end{bmatrix}$.

- Discuss the consistency of the following system of equations and if possible solve them $2x - y - z = 2, x + 2y + z = 2, 4x - 7y - 5z = 2.$
- Use matrix method to determine the value of λ for which the equations $x + 2y + z = 3, x + y + z = \lambda, 3x + y + 3z = \lambda^2$ are consistent and solve them for any one value of $\lambda.$
- Solve $2x - y + 3z = 0, 3x + 2y + z = 0, x - 4y + 5z = 0,$ by matrix method.

Q2) Attempt any three of the following.

[15]

- Examine for linear dependence of vectors $(1, 2, -1, 0), (1, 3, 1, 2), (4, 2, 1, 0), (6, 1, 0, 1)$ and find a relation between them if dependent.



P.T.O.

- b) Determine the Eigen values and Eigen vector corresponding to greatest

Eigen value only, for $\begin{bmatrix} 4 & 6 & 6 \\ 1 & 3 & 2 \\ -1 & -4 & -3 \end{bmatrix}$.

- c) Find the Eigen values of matrix $A = \begin{bmatrix} 4 & 2 & -2 \\ -5 & 3 & 2 \\ -2 & 4 & 1 \end{bmatrix}$. Hence find Eigen values for A^4 , A^{-1} , $5A$ by using properties of eigen values.

- d) Verify Cayley Hamilton theorem for $A = \begin{bmatrix} 1 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{bmatrix}$.

Q3) Attempt any four of the following.

[20]

a) Simplify $\frac{(\cos 5\theta - i \sin 5\theta)^2 (\cos 7\theta + i \sin 7\theta)^{-3}}{(\cos 4\theta - i \sin 4\theta)^9 (\cos \theta + i \sin \theta)^5}$.

b) Find all the values of $\left(\frac{1}{2} + i\frac{\sqrt{3}}{2}\right)^{1/4}$.

c) Prove that $\tanh^{-1} x = \frac{1}{2} \log \left(\frac{1+x}{1-x} \right)$.

d) Express $\frac{\sin 7\theta}{\sin \theta}$ in powers of $\sin \theta$ only.

e) Prove that $\left(\frac{\cosh x + \sinh x}{\cosh x - \sinh x} \right)^n = \cosh 2nx + \sinh 2nx$.

f) Express $\cos^{-1} \left(\frac{3i}{4} \right)$ in the form $(a + ib)$.

SECTION-II

[15]

Q4) Attempt any three of the following.

a) Expand $e^{x \cos x}$ in powers of x upto x^4 term.

b) Use Maclaurin's series to expand function $\tan \left(\frac{\pi}{4} + x \right)$ in a ascending power of x .

c) Use Taylor's series to find $(\sqrt{25.15})$ correct upto four decimal places.

d) Evaluate $\lim_{x \rightarrow 1} \left[\frac{x - x^x}{1 + \log x - x} \right]$.

Q5) Attempt any four of the following.

[20]

a) If $u = \log(x^3 + y^3 - x^2y - xy^2)$ then prove that $\left(\frac{\partial}{\partial x} + \frac{\partial}{\partial y} \right)^2 u = \frac{-4}{(x+y)^2}$.

b) If $u = \frac{1}{2} \log(y^2 - x^2)$ then find the value of $\left(x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} \right)$.

c) If $u = xyz$; $v = x^2 + y^2 + z^2$; $w = (x+y+z)$ then find $J \left(\frac{u, v, w}{x, y, z} \right)$.

d) Find the minimum and maximum values of $(x^3 + 3xy^2 - 3x^2 - 3y^2 + 4)$.

e) If power P is given by $P = \left(\frac{E^2}{R} \right)$. Find the approximate percentage error in power P if E is increased by 3% and R is decreased by 2%.

SF - 2

Total No. of Pages : 3

Seat
No.

F.E. (All Branches) (Semester - I & II) (New)

Examination, November - 2017

ENGINEERING PHYSICS

Sub. Code: 59176

Day and Date : Friday, 03 - 11 - 2017

Total Marks : 100

Time : 2.30 p.m. to 5.30 p.m.

- Instructions :
- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Given:-
Avogadro's number = 6.02×10^{26} /kg.atom
Planck's constant $h = 6.63 \times 10^{-34}$ J.s
Electronic charge $e = 1.6 \times 10^{-19}$ C
Electron mass $m = 9.1 \times 10^{-31}$ kg

SECTION - I

Q1) Attempt Any Three from the following questions.

- a) What is grating? Give theory of plane transmission grating for normal incidence. [6]
- b) Explain construction and working of Laurent's half shade polarimeter. [6]
- c) i) What is double refraction? [3]
ii) A tube of sugar solution 20 cm long is placed between crossed Nicols and illuminated with a monochromatic light. If the optical rotation produced is 13° and specific rotation is $65^\circ \text{dm/g/cm}^3$, determine the concentration of the solution. [2]
- d) A grating has 6000 lines per cm on it. Its width is 10cm, calculate
i) the resolving power in the second order and
ii) the smallest wavelength that can be resolved in the third order in 6000 Å wavelength. [5]



P.T.O.

Q2) Attempt Any Three from the following questions.

- With neat diagram explain construction and working of ruby laser. [6]
- Discuss industrial and medical applications of laser. [6]
- Explain the advantages of optical fiber. [5]
- With suitable diagram explain the terms : acceptance angle, acceptance cone and Numerical aperture of an optical fiber. [5]

Q3) Attempt Any Three of the following questions.

- What is nuclear reactor? Explain various features used in the classification of a Nuclear reactor. [6]
- Calculate the power output of a nuclear reactor which consumes 50gm of U^{235} Per day. Assume 5% reactor efficiency. Given: Energy released per fission of U^{235} Is 200MeV. [5]
- What do you mean by thermonuclear reactions? Give proton-proton chain reaction. [5]
- Write note on fusion power reactor. [5]

SECTION - II

Q4) Attempt Any Three from the following questions.

- Find the number of atoms per unit cell, the coordination number and the atomic radius of BCC lattice. [6]
- What are Miller Indices? How are they determined?
Draw the planes in cube (111) and (110) [6]
- Explain the terms unit cell and their types. [5]
- Explain the centre of symmetry. [2]
 - A beam of X-rays of wavelength 0.71 Å is diffracted by (110) plane of rock salt with lattice constant of 2.8 Å. Find the glancing angle for the second order diffraction. [3]

Q5) Attempt Any Three from the following questions.

- Discuss de-Broglie's concept of matter waves. Find an expression for the de-Broglie wavelength associated with a particle accelerated through a potential difference 'V' volts. [6]
- What is Compton Effect? Explain experimental arrangement used to study Compton Effect. Write the formula for Compton Shift. [6]
- State and explain Heisenberg's uncertainty principle. [5]
- State properties of matter wave. [2]
 - Determine the velocity and kinetic energy of a neutron having de-Broglie wavelength 1.0 Å. Mass of neutron is 1.67×10^{-27} kg. [3]

Q6) Attempt Any Three from the following questions.

- With neat diagram explain construction and working of Atomic Force Microscope. [6]
- Explain the electrical, magnetic and mechanical properties of nanomaterials. [5]
- What are different types of the CNT? Explain any two properties of CNT in detail. [5]
- Explain the ball milling method for getting nano particles. [5]

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Seat
No.

F.E. (All Branches) (Semester - I & II) (Revised)

Examination, November - 2017

BASIC ELECTRICAL ENGINEERING

Sub. Code : 59178

Day and Date : Thursday, 09-11-2017

Total Marks : 100

Time : 2.30 p.m. to 5.30 p.m.

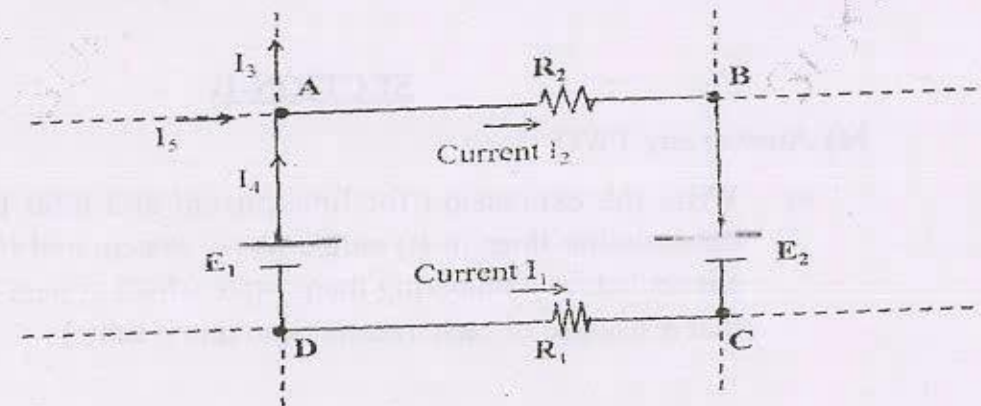
- Instructions :
- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Draw neat labeled diagrams as a part of explanation.
 - 4) In case of any missing data, assume suitable value. State it clearly.

SECTION-I

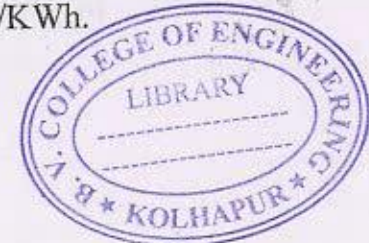
Q1) Answer any TWO:

[2×9=18]

- a) State Kirchhoff's laws. Write KCL and KVL equations for node A and loop ABCDA in following circuit. Explain the sign rules used while writing your equations.



- b) Derive an expression for Magneto motive force of a series magnetic circuit having three different magnetic materials. Draw equivalent electrical circuit and equivalent expression for the same.
- c) An electric toaster has rating 1000 W, 240V. Find its resistance. The toaster is connected to 220V supply instead of the rated voltage. Now calculate current & power taken at 220V. If toaster works for 5 minutes, Calculate the cost of energy at Rs. 4/KWh.



P.T.O.

SF-4

Q2) Answer any TWO:

[2×9=18]

- Derive the mathematical expression for average value of sinusoidal AC by analytical method. Mention one application where average value of AC is important.
- Define power factor in AC system. State causes and drawbacks of low power factor.
- If a single phase series A.C. circuit has applied voltage $v = 100 \sin(\omega t + 20^\circ)$ volt and current $i = 15 \sin(\omega t + 60^\circ)$ ampere

Determine - Impedance, phase difference, power factor, Resistance, Reactance, Power.

Q3) Answer any TWO:

[2×7=14]

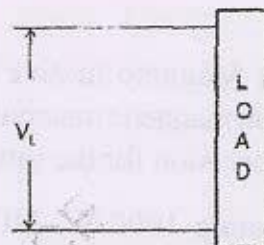
- Draw and explain working of single phase induction type energy meter.
- State the importance of earthing in electrical installation. Explain with neat sketch any one earthing method.
- Draw circuit diagram and explain the operation of fluorescent tube working on sinusoidal AC voltage. State its advantages as compared to incandescent bulb.

SECTION-II

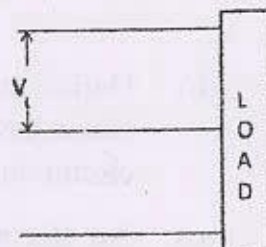
Q4) Answer any TWO:

[2×7=14]

- Write the expression for line current and total I^2R power loss in transmission lines in (i) single phase system and (ii) 3 phase system shown below. Comparing them, state which system is better. (Assume that resistance of each transmission line is same)



Load takes power P
Pf of load = $\cos \Phi$



Load takes power P
Pf of load = $\cos \Phi$

SF-4

- Draw circuit diagram for (i) star connected circuit (ii) delta connected circuit. Show line voltage, phase voltage, line current, phase current on each diagram. For each circuit, write the relation between (1) line voltage and phase voltage (2) line current and phase current.
- Define and explain
 - balanced 3 phase supply
 - phase sequence
 - balanced 3 phase load

Q5) Answer any TWO:

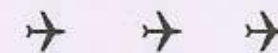
[2×9=18]

- List the advantages of rotating field alternator as compared to rotating armature alternator. Why slip rings-brushes are required in an alternator?
- Explain the working of transformer with load. Draw suitable diagrams.
- Two windings of a transformer have 1000 turns and 500 turns. It is used as a step up transformer with 200 V ac supply and 0.8 pf load. The load current is 5A. Find (i) secondary voltage (ii) primary current (iii) the copper loss at this load, (iv) efficiency of transformer at this load. Given: Iron loss of the transformer = 30W, Copper loss of the transformer at 1A load current is 3W.

Q6) Answer any TWO:

[2×9=18]

- State important features of universal motor. What are the disadvantages due to commutator?
- List the differences between split phase induction motor and shaded pole induction motor? With reasons state which of the above motors is preferred for (i) compressor (ii) sound recording instrument.
- Explain the working of split phase induction motor. Draw suitable diagrams.



SF-6

Total No. of Pages : 3

Seat No.	
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First Year Engineering (All Branches) (Semester - II) (New)

Examination, November - 2017

BASIC CIVIL ENGINEERING

Sub. Code :59179

Day and Date : Tuesday, 14- 11 - 2017

Total Marks : 100

Time : 2.30 p.m. to 5.30 p.m.

- Instructions :
- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Make suitable assumptions wherever necessary and mention it clearly.
 - 4) Use of non-programmable calculator is allowed.

SECTION - I

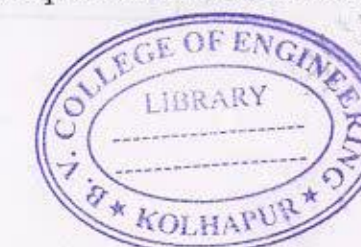
Q1) a) Explain significance of branches of Civil Engineering. [8]

OR

- a) Enlist various principles of building planning. Explain Privacy, Sanitation in detail. [8]
- b) Write short note on orientation of building. [4]
- c) Write down the specific Bye Laws for, [4]
 - i) Open space requirement
 - ii) FSI

Q2) Answer the following. [18]

- a) Differentiate between:
 - i) Uniform and differential settlement
 - ii) Shallow and Deep foundation
- b) Explain with neat sketch functions of different elements of substructure and superstructure.
- c) What is deep foundation? Explain pile foundation with neat sketch.



P.T.O.

SF-6

i) a) Write short note on

- i) Different roofing materials.
- ii) Types of cement with their properties.

OR

a) Differentiate between

- i) load bearing and framed structures.
- ii) RCC steel and structural steel

b) What are the characteristics of good brick?

c) Write uses of plastic as a Building material.

SECTION - II

- 14) a) Classify surveying on the basis of instruments used? Explain the principles on which surveying works. [4]
- b) State & Explain in detail Principle of Optical Square. [4]
- c) The distance between two villages was measured with a 20 m chain and was found to be 2719 m. The same distance was measured with 30 m chain and was found to be 13,600 links. The test shows that both chains were incorrect. What correction is required in the 20 m chain, if the 30 m chain is 0.5 links too long? [8]

OR

Observed bearings for a closed compass traverse are given below. Find the local attraction at each end of the affected station and correct all bearings. Tabulate the data and results. Find also included angles. Show all calculations. [8]

Line	PQ	QR	RS	ST	TP
F.B	N 48° W	N 9° E	S 83° E	S 15° E	S 64° W
B.B	S 50° E	S 7° W	N 80° W	N 15° W	N 65° E

SF-6

5) a) Attempt any Two questions from following

- i) How planimeter is used for measuring areas of irregular figures? [4]
- ii) Differentiate between Rise & fall method and collimation plane method. [4]
- iii) Explain characteristics of contours with neat sketch. [4]

b) The following staff readings were observed on a continuously sloping ground with the help of a dumpy level and 4m staff at 30 m interval. The last reading was taken on B.M. of RL 240.120 m.

0.420, 1.660, 2.880, 0.580, 1.385, 2.270, 2.995, 3.800, 0.625, 2.365, 3.225, 3.630.

Enter the readings in a page of level book. Find R.L.s by Rise and Fall method. Apply usual checks. Determine longitudinal gradient. [10]

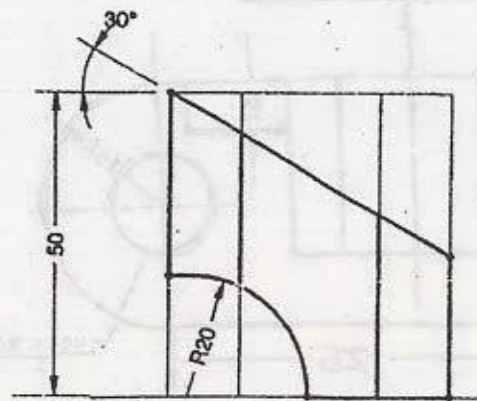
- 16) a) Differentiate between rigid and flexible pavement. [4]
- b) Explain the components of railway track (Broad gauge). [4]
- c) State the types of dams. Explain gravity dam with neat sketch. [4]
- d) Explain with neat diagram functions of units in water treatment plant. [4]



Q6) Solve any one.

a) Solve.

- A right circular cone of base dia. 50mm & axis 70mm stands on HP. It is cut by AVP which makes an angle 60° to VP & 8mm away from axis. Draw SFV, TV & true shape of section. [7]
- Figure shows FV of hexagonal prism with two cutting planes. Complete the development of lateral surfaces of prism. [6]



OR

b) Solve.

A pentagonal base pyramid with base side 25mm & height 50mm is resting on HP. With one of its base edge perpendicular to VP. It is cut by section plane 45° to HP & passing through its RHS corner. Draw FV, sectional TV, and true shape of section also development of remaining part of pyramid. [13]



Seat
No.

F. E. (All Branches) (Part - I) (Semester - I & II) (Revised)

Examination, November - 2017

ENGINEERING GRAPHICS

Sub. Code : 59180

Day and Date : Wednesday, 22 - 11 - 2017

Total Marks : 100

Time : 02.30 p.m. to 06.30 p.m.

- Instructions :
- 1) Assume suitable data if necessary.
 - 2) Use both sides of drawing paper.
 - 3) All dimensions are in mm.
 - 4) All questions are compulsory.

SECTION - I

Q1) Solve any two : [12]

- Construct hyperbola having focus 70 mm away from directrix and eccentricity $4/3$. Also draw a tangent & normal at any point P on curve.
- To construct an Archimedean spiral of two revolutions, given the greatest & shortest radius is 100mm & 10mm resp.
- A circle of 50mm diameter rolls on horizontal line for half revolution clockwise and then on a vertical line for another half revolution. Draw the curve traced out by a point 'P' on base of circumference of circle.

Q2) a) Solve any three. [12]

- Complete the projections of line AB having its TL is 60mm, bearing of S60E & FV makes an angle 30° to HP. (Ref. Fig. 1 (i))
- Find angle between line AB & CD. (Ref. Fig. 1 (ii))
- Line AB is parallel to line CD having true length 50 mm. Complete the projections of line CD. (Ref. Fig. 1 (iii))
- Find angle made by plane PQR with HP and VP. (Ref. Fig. 1 (iv))



SF - 8

b) Solve.

[13]

A triangular Plate ABC, AB = 60 mm, BC=45 mm and AC=30mm has its longest side in VP and inclined at 30° to HP. Draw its projections if its surface is inclined at 45° to the VP.

Q3) Solve.

[13]

A right circular cylinder with 50mm dia. & height 70mm rest on Hp. Such that the base is inclined at 60° to HP & its axis is inclined 45° to VP. Complete projections of cylinder.

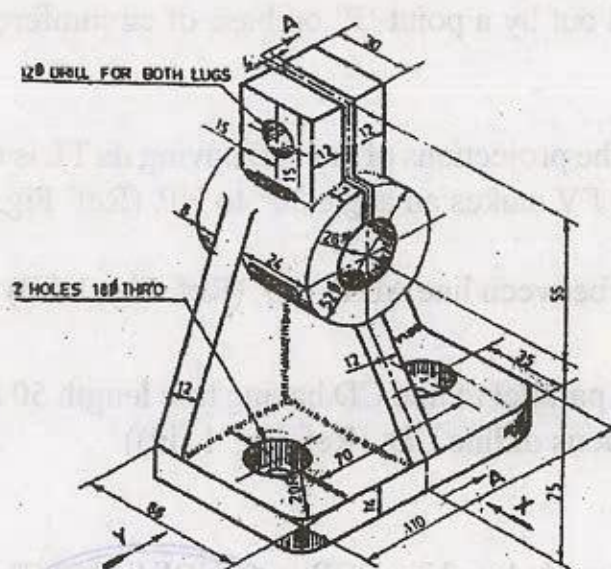
SECTION -II

Q4) Solve.

[24]

The following figure shows a bracket. Draw the following views:

- FV from X direction
- TV&
- Sectional LHSV along section AA.

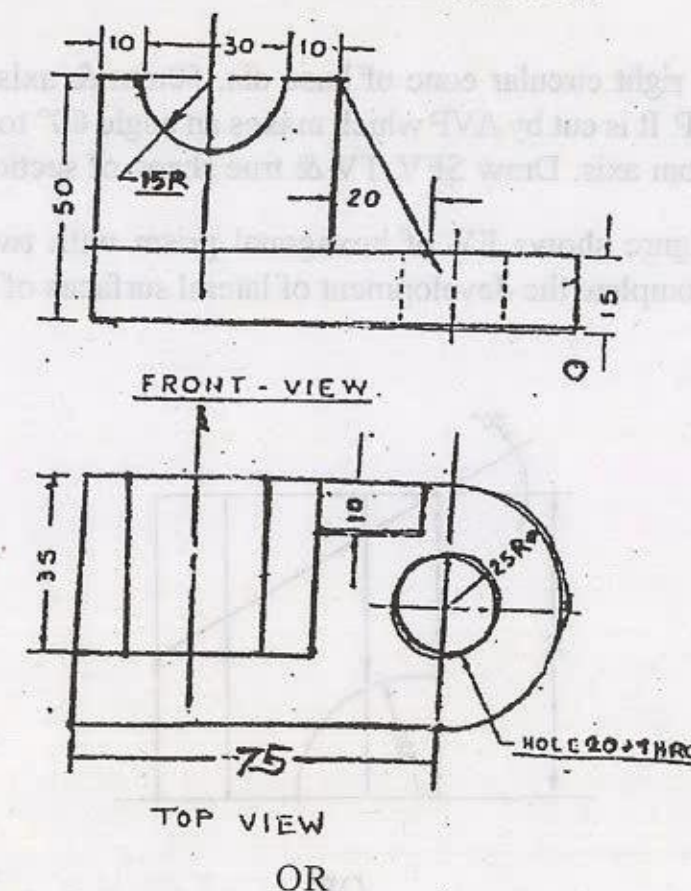


SF - 8

[13]

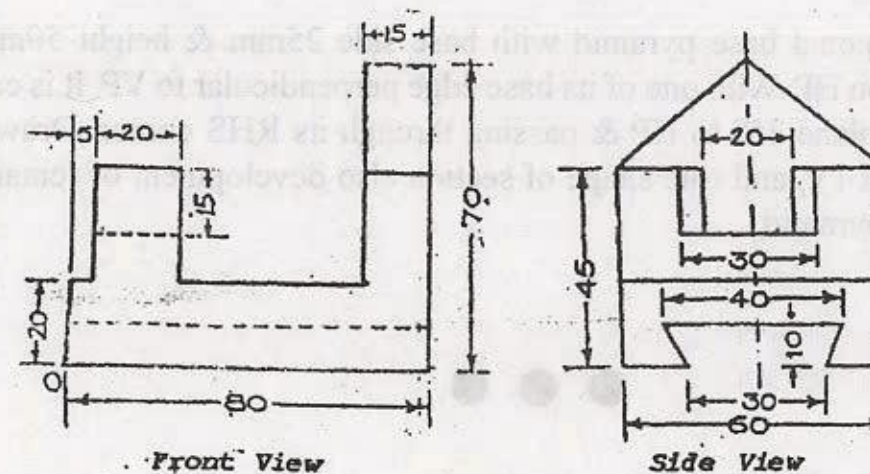
Q5) Solve any one.

- Figure shows the views. Draw its isometric view.



- Figure shows the views. Draw its isometric view.

[13]



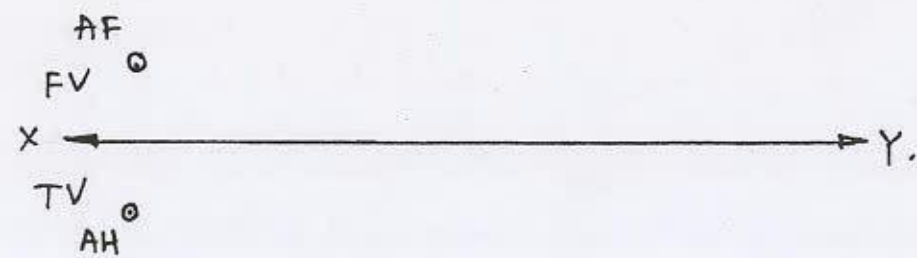


Fig 1.i

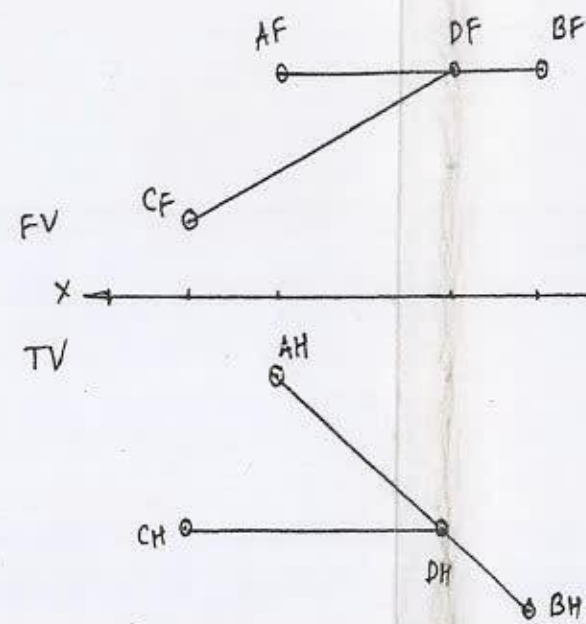


Fig 1.ii

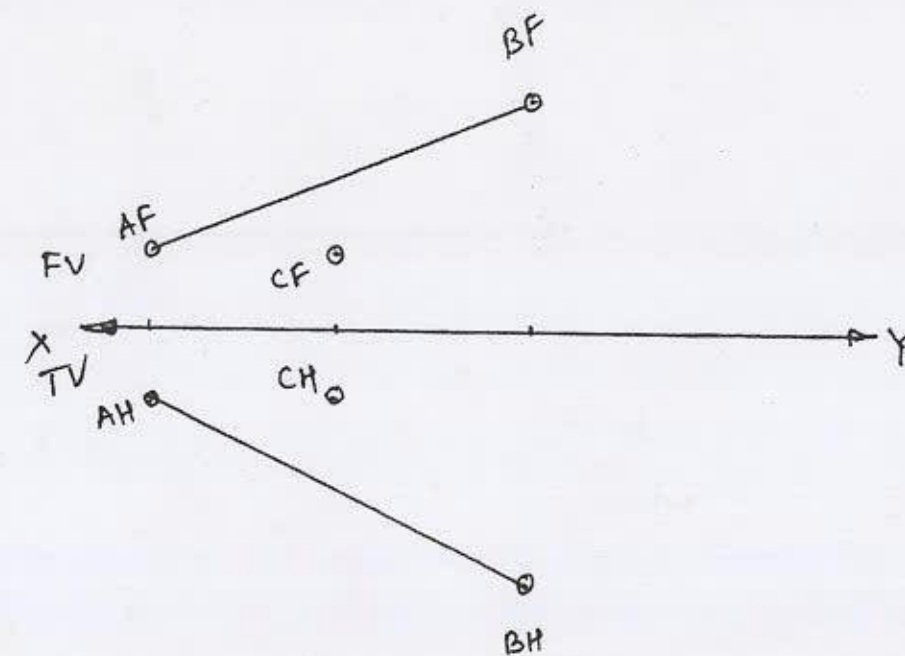


Fig 1.iii

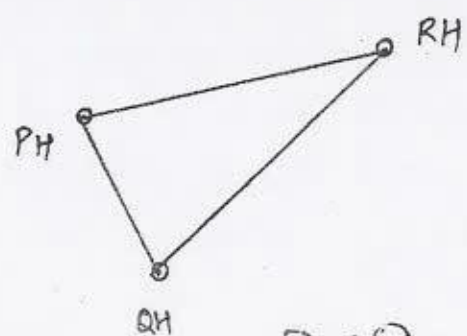
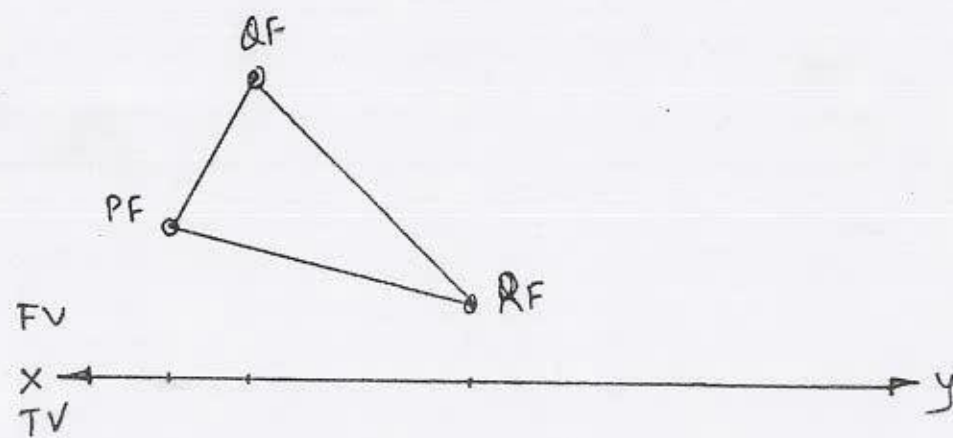


Fig 1.iv

Q.No.	1	2	3	4	5	6	Signature of the Examiner
Marks							
Sr. No.							Signature of Jr. Supervisor
Examination : _____ Paper No. _____ Section _____							
Subject							Code No.
SHIVAJI UNIVERSITY, KOLHAPUR							
Name of Exam : _____							Code No.
Paper No. _____ Section _____							
Seat No. _____ Centre _____							

Seat No.	
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F.E. (All Branches) (Semester- I & II) (Revised)

Examination, November - 2017

ENGINEERING CHEMISTRY

Sub. Code : 59183

Day and Date : Tuesday, 07-11-2017

Total Marks : 100

Time : 2.30 p.m. to 5.30 p.m.

- Instructions :
- 1) All questions are compulsory.
 - 2) Assume suitable data wherever necessary.
 - 3) Draw neat labeled diagram wherever necessary.
 - 4) Figures to the right indicate full marks.

SECTION-I

Q1) a) A sample of water on analysis was found to contain the following salts:[8]

Salt	Salt mass in mg/lit.	Mol. Wt.
$\text{Ca}(\text{HCO}_3)_2$	26.2	162
$\text{Mg}(\text{HCO}_3)_2$	21.9	146
CaCl_2	23.0	111
MgSO_4	36.0	120
NaCl	28.5	58.5

Calculate temporary, permanent and total hardness of sample in degree French.

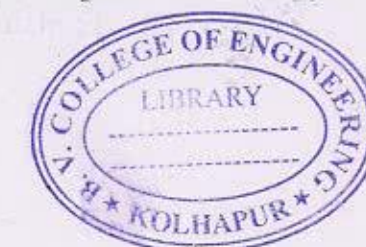
b) Solve any two questions: [10]

- i) What are the advantages and disadvantages of instrumental methods of analysis?
- ii) Explain properties and applications of ERP.
- iii) Explain reverse osmosis process for purification of water.

Q2) a) Explain the principle, construction and working of glass electrode. [6]

b) Solve any TWO of the following: [10]

- i) What is scale and sludge formation? Explain mechanism of scale formation.
- ii) Give preparation, properties and applications of Bakelite.
- iii) What are composite materials? Explain the characteristics of composite materials.



P.T.O.

SF-3

[16]

3) Solve any four of the following:

- Write the applications of gas chromatography.
- What is Dissolved Oxygen of water? Explain in detail.
- State and derive an equation for Lambert's law.
- Explain any four applications of nanomaterials.
- Explain the addition and condensation polymerization reaction with suitable example.
- Write note on acidity of water.

SECTION-II

14) a) Solid fuel weighing 1.097gm and containing C = 90.7%, H = 6.7% and ash = 2.6%. Have the following results in the Bomb calorimeter experiment:

Water equivalent of calorimeter = 1230gm, Amount of water taken = 3376gm,

Initial temp. of water = 27.6°C, Correction due to acids = 68.7 cal.,

Cooling correction = 0.066 °C, Final temp. of water = 33.9°C,

Correction due to fuse wire = 9.0cal.

Calculate the gross and net calorific values of the solid fuel in Joule. [8]

b) Attempt any two questions: [10]

- What is corrosion? Explain chemical corrosion with suitable diagram.
- How will you determine calorific value of liquid fuel?
- What is an alloy? Explain the purposes of alloying with suitable example.

25) a) What are non ferrous alloys? Explain the nickel alloy giving their composition, properties and uses. [6]

b) Solve any two of the following: [10]

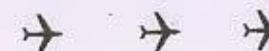
- Compare of liquid fuel between gaseous fuels.
- Describe hydrogen evolution mechanism in wet corrosion with suitable diagram and reactions.
- Explain the factors influencing on the rate of corrosion.

SF-3

[16]

16) Answer of the following four questions:

- Explain in detail any four characteristic of a good fuel.
- Discuss the importance of design in controlling corrosion.
- Explain any four applications of Fuel Cells in various fields.
- State composition, properties and uses of Duralumin.
- Explain process of electroplating for prevention of corrosion.
- Write short note on green chemistry.



SF-236

Total No. of Pages : 2

Seat No.	
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B.E. (CSE) (Part - IV) (Semester - VII) (Revised)

Examination, November - 2017

DISTRIBUTED SYSTEMS

Sub. Code : 67542

Day and Date : Monday, 13-11-2017

Total Marks : 100

Time : 2.30 p.m. to 5.30 p.m.

- Instructions :**
- 1) Question 4 and question 8 are compulsory, attempt any two questions from que.1 to 3 from section I and que. 5 to 7 from section II.
 - 2) Figures to the right indicate full marks.

SECTION - I

- Q1) a)** Explain the process of binding a client to a server in DCE RPC. [8]
- b)** What are different scaling techniques can be applied to achieve scalability in distributed system? [8]
- Q2) a)** Explain token ring mutual exclusion algorithm in detail. [8]
- b)** Define the terms error and fault. Classify and explain the faults. [8]
- Q3) a)** Explain UNIX semantics, Session Semantics and Immutable files semantics of file sharing. [8]
- b)** Explain the server replication mechanism used in CODA. [8]
- Q4) Attempt any three** [18]
- a) Sensor networks.
 - b) Berkeley Algorithm.
 - c) Collaborative distributed systems.
 - d) Compound procedures used in ONC RPC in NFS v4.

P.T.O.



SECTION-II

- Q5) a) Describe implementation level of virtualization in Cloud Computing? [8]
b) What is the benefits using virtualization in Cloud Computing? [8]
- Q6) a) Explain virtualization at Application level? [8]
b) Explain Database as a Service (DBaaS) in Cloud Computing? [8]
- Q7) a) What are different threats on Data stored in cloud? [8]
b) What are the advantages of "Platform as a Service" (PaaS)? [8]
- Q8) Write note on [18]
a) Advantages of Using cloud storage gateways (CSG).
b) Cloud Firewall.
c) Virtual Firewall.



Seat No.	
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B.E. (CSE) (Part-IV) (Semester-VII) (Revised)
Examination, November - 2017
ADVANCED DATABASE SYSTEMS
Sub. Code : 67543

Day and Date : Wednesday, 15-11-2017

Total Marks : 100

Time : 2.30 p.m. to 5.30 p.m.

- Instructions :**
- 1) Attempt any three questions from each section.
 - 2) Figures to the right indicate full marks.
 - 3) Assume suitable data wherever necessary.

SECTION-I

- Q1) a)** What do you mean by replication and fragmentation w.r.t. distributed database? Briefly explain the advantages and disadvantages to replication. [8]
- b)** What are transaction-server systems? For data server systems, explain the following [8]
- i) Locking
 - ii) Data caching
 - iii) Lock caching
- Q2) a)** What is an Object Identity? Explain the system-generated OID and the immutability Property of an object. [8]
- b)** What is Persistent object? Explain the approaches to make the Object Persistent? [8]
- Q3) a)** State some of the object database features that have been included in SQL. Also give an example of UDTs in SQL to create complex structured object. [8]
- b)** With the help of an appropriate figure of the database life cycle, explain in detail database initial study phase. [8]

P.T.O.



Q4) Write short notes on any three:

[18]

- a) 2-phase commit
- b) ODL
- c) Persistence
- d) top-down versus bottom-up design

SECTION-II

Q5) a) Explain the intuition behind the two rules in the Bell-LaPadula model for mandatory access control. [4]

b) Give an example of how covert channels can be used to defeat the Bell-LaPadula model. [4]

c) Explain the statistical database security. [8]

Q6) a) Explain document type definition. Describe a DTD with suitable example for an XML. [8]

b) Write the applications of XML. [4]

c) What is Xquery? Explain FLOWR expression with example? [4]

Q7) a) What is data warehouse? What is the difference between data warehouse and operational database system? [6]

b) Explain Following [4]

i) Data cube

ii) OLAP

c) With neat schematic explain business intelligence architectural components? [6]

Q8) Write a short note on (any three)

[18]

- a) Polyinstantiation
- b) XML schema
- c) Classification algorithm
- d) Grant and Revoke with example.



SF - 430

Total No. of Pages : 3

Seat No.	
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B.E. (Computer Science and Engineering) (Semester-VII)

Examination, November - 2017

MOBILE APPLICATIONS (El. - 1)

Sub. Code : 67546

Day and Date : Tuesday, 21 - 11 - 2017

Total Marks : 100

Time : 2.30 p.m to 5.30 p.m.

- Instructions :**
- 1) Figures to the right indicates full marks.
 - 2) Question no 4 and 8 are compulsory
 - 3) Attempt any two questions from remaining questions in each section

SECTION - I

- Q1) a)** What are mobile website navigation techniques [6]
- b)** What is native app, hybrid app and web app in mobile app technology stack. [6]
- c)** Explain about standard OMA. [4]
- Q2) a)** Write a note on HTML 5. [6]
- b)** Explain in detail about WAP 1.0 [6]
- c)** Write short note on Web Services [4]
- Q3) a)** Explain the difference between XML and JSON [6]
- b)** What are the best practices while designing a mobile website? [6]
- c)** Explain in detail about Fallback mechanism. [4]

P.T.O.



Q4) Write short note on (Any Three)

[18]

- a) Android emulator
- b) W3C
- c) RESS
- d) Tools for Mobile Web Development

SECTION - II

Q5) a) Explain the role of responsive images in mobile application development
How we can use Sencha. IO to create responsive images [6]

b) Explain various problems mobile application developer face regarding
feature support on a particular platform. Briefly describe their solutions. [6]

c) Describe how we can use HTTP header for device detection at server
side [4]

Q6) a) Explain in detail JavaScript APIs for handling touch and gesture events
in mobile application [6]

b) Compare Zepto.js with jQmobi. [6]

c) What is J2ME? How are the tools available for J2ME programming? [4]

Q7) a) Describe how W3C Geolocation API is used for getting a location as
well as tracking a particular location. [6]

b) Compare Native App And Mobile Web App. [6]

c) List various JavaScript mobile UI patterns. Explain ANY one. [4]

Q8) Write a short note on (any three) [3×6=18]

a) Web Sockets.

b) Device Interaction.

c) GSMA One API.

d) HTTP Sniffing.

Seat No.	
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B.E. (Computer Science & Engg.) (Semester - VIII) (Revised)**Examination, November - 2017****DATA ANALYTICS****Sub. Code : 67824****Day and Date : Wednesday, 01 - 11 - 2017****Total Marks : 100****Time : 10.00 a.m. to 1.00 p.m.**

- Instructions :**
- 1) Figures to the right indicate full marks.
 - 2) Q.4 & Q.8 are compulsory.
 - 3) Attempt any two questions from Q.1, to Q.3 and from Q.5 to Q.7.

- Q1) a)** Explain the phases in the developments of Business Intelligence System with the help of neat diagram? **[8]**
- b)** Explain Star Schema, Snowflake Schema, Galaxy Schema with proper example? **[8]**
- Q2) a)** Explain different categories of mathematical models for decision making? **[8]**
- b)** Explain in detail process of univariate analysis? **[8]**
- Q3) a)** Explain HDFS Architecture and the working of Hadoop Heartbeat message in HDFS with proper figure? **[8]**
- b)** Explain data validation process in data preparation. **[8]**
- Q4) Write a note on (Attempt Any Three) :** **[18]**
- a) Data Warehouse Architecture.
 - b) Hive, HBase, Pig & Pig Latin.
 - c) Multivariate Analysis.
 - d) Data mining tasks.

**P.T.O.**

- Q5) a) Explain simple linear regression model and structure of regression model. [8]
 b) Discuss the structure and phases of the learning process for a classification with a neat diagram. [8]
- Q6) a) Explain in detail any one algorithm used for partition methods. [8]
 b) Explain the general association rules that is useful for range of applications. [8]
- Q7) a) List and explain the different functions to handle the data in R workspace with an example. [8]
 b) List and explain the various types of R commands to import data. [8]
- Q8) Write a short note on (Any Three) : [18]
 a) Bayesian methods.
 b) Exporting data from R.
 c) Hierarchical clustering methods.
 d) Apriori algorithm.



SF - 241

Total No. of Pages :2

Seat No.	
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B.E. (Computer Science) (Semester - VIII) (Revised)
Examination, November - 2017
REAL-TIME OPERATING SYSTEM
Sub. Code:67826

Day and Date :Friday, 03 - 11 - 2017
Time :10.00 a.m. to 1.00 p.m.

Total Marks : 100

- Instructions :**
- 1) Solve Any Three Questions from each section.
 - 2) Figures to right indicate full marks.

SECTION-I

- Q1) a)** What is Real-Time System? Explain Real-time system examples. [8]
- b)** Explain following terminologies related to hardware interfacing: [8]
- i) Latching
 - ii) Edge vs Level Triggered
 - iii) Tristate logic
 - iv) IEEE 1394 Firewire
- Q2) a)** Explain memory-mapped I/O with suitable diagram. [8]
- b)** Explain operation of mailboxes? How critical section problem can be handled using mailboxes? [8]
- Q3) a)** What is priority inversion ? Explain priority ceiling protocol. [8]
- b)** Explain task control block model in detail. [8]

P.T.O.



Q4) Write a note on- (Any Three)

[18]

- a) Polled loop
- b) Test-and-Set-Instruction
- c) Watchdog timers
- d) Ring Buffers

SECTION -II

Q5) a) Explain requirement engineering process in desing of real time systems. [8]

b) What are formal methods in software specification? State its limitations. [8]

Q6) a) Explain how to organize the requirements document. [8]

b) What is COCOMO? Explain COCOMO-II in detail. [8]

Q7) a) Explain real-time features of C# and Java. [8]

b) Explain semaphore and mutex management in RTLinux. [8]

Q8) Write a note on-(Any Three)

[18]

- a) Mc Cabe's Metric
- b) Function points
- c) RTLinux
- d) Assembly language

& & &

SF-962

Total No. of Pages : 2

Seat No.	
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B.E. (Computer Science and Engg.) (Semester-VIII)
(Revised) Examination, November - 2017
SOFTWARE TESTING AND QUALITY ASSURANCE
(Elective-II)
Sub. Code : 67828

Day and Date : Monday, 06-11-2017

Total Marks : 100

Time : 10.00 a.m. to 1.00 p.m.

- Instructions :
- 1) Q. 4 and Q. 8 are Compulsory.
 - 2) Attempt any two questions from Q. 1 to Q. 3.
 - 3) Attempt any two questions from Q. 5 to Q. 7.

SECTION-I

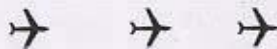
- Q1) a)** What is software testing? Why should we test? [8]
b) Explain V shaped software lifecycle model. [8]
- Q2) a)** What are different software verification methods? [8]
b) What do you mean by software project audit? Explain in brief project audit and review checklist. [8]
- Q3) a)** Explain use cases and use case diagram in detail? [8]
b) What is regression testing? [8]
- Q4) Write a note on (Any two):** [18]
a) Software failures with example.
b) SRS document verification.
c) Risk analysis.



P.T.O.

SECTION-II

- Q5) a) Which are broad categories of software metrics? Explain in detail. [8]
b) Compare client server application and web based application. [8]
- Q6) a) What should we measure during testing? [8]
b) Write a note on user interface testing. [8]
- Q7) a) Which are the several problems with the function points measure? [8]
b) What is automated test data generation.? [8]
- Q8) Write a note on (Any two): [18]
a) Measurement in software engineering.
b) Albretch's approach.
c) Security testing.



SF-244

Total No. of Pages : 2

Seat No.	
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**B.E. (Computer Science & Engg.) (Semester - VIII) (Pre-revised)
(Old) Examination, November - 2017
GRID TECHNOLOGY
Sub. Code : 49447**

Day and Date : Wednesday, 01 - 11 - 2017

Total Marks : 100

Time : 10.00 a.m. to 1.00 p.m.

- Instructions :
- 1) Q.4 & Q.8 are compulsory.
 - 2) Attempt any two questions from Q.1, Q.2, Q.3.
 - 3) Attempt any two questions from Q.5, Q.6, Q.7.
 - 4) Figures to the right indicate full marks.

SECTION - I

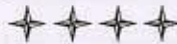
- Q1) a)** With schematic explain basic structure of GT3 and their base services. [8]
b) What is grid computing? What are the types of grid computing? Explain different topologies of grid computing? [8]
- Q2) a)** Explain semantic workflow enactment in geodise. [8]
b) What is autonomic computing? Explain the features of autonomic computing? [8]
- Q3) a)** What is RDF? Why RDF is essential in GRID? Explain RDF data model. [8]
b) Define web service and explain the structure of soap and wsdl. [8]
- Q4) Write a short note on (Any Three) :** [18]
a) Grid related standard bodies.
b) Portal Lab.
c) RPC.
d) OGSA and OGSI.



P.T.O.

SECTION - II

- Q5) a) Explain the role of directory service, producer and consumer in GMA? [8]
b) With neat schematic explain different daemons in condor pool. [8]
- Q6) a) Explain cloud deployment models? Discuss about pros and cons cloud computing? [8]
b) What is virtualization? What are the characteristics of virtualization? Explain foundational issues of virtualization. [8]
- Q7) a) What is storage as a service provider? Explain different aspects of data security. [8]
b) Explain Job life cycle and Job Management in Codor. [8]
- Q8) Write a short note on (Any Three) : [18]
a) SOA.
b) Credential delegation & single sign-on.
c) Client Desktop.
d) Scheduling Paradigms.



SF-227

Total No. of Pages : 2

Seat No.	
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T.E. (Computer Science & Engineering) (Semester-V)
(Revised) Examination, November - 2017
COMPUTER GRAPHICS (Theory)
Sub. Code : 66293

Day and Date : Thursday, 09-11-2017

Total Marks : 50

Time : 9.30 a.m. to 11.30 a.m.

- Instructions :
- 1) Q. No. 3 and Q. No. 6 are compulsory. Attempt any one from Q. No. 1 and Q. No. 2 and any one from Q. No. 4 and Q. No. 5.
 - 2) Figures to the right indicate full marks.
 - 3) Assume suitable data if necessary.

Q1) a) What is scaling? Explain in detail 2D scaling transformation. [6]

b) Write and explain Bresenham's line drawing algorithm in first octant. [6]

Q2) a) Explain in detail the rotation of object about the arbitrary axis in space. [6]

b) Explain Run Length Encoding (RLE) scan conversion method. [6]

Q3) a) Explain midpoint subdivision algorithm for line clipping with example. [7]

b) Write a note on windowing and view porting. [6]

Q4) a) Explain parametric representation of cubic spline curve segment. [6]

b) What is key frame animation? Explain different methods of key frame animation. [6]



P.T.O.

- Q5) a) Explain diffuse reflection model for calculating surface intensity at a given point. [6]
- b) What is halftoning. Explain halftone approximation method for a 3 by 3 pixel grid on a bilevel system. [6]
- Q6) a) Explain Warnock algorithm for hidden surface removal. [7]
- b) What is warping? Explain feature-based image warping method. [6]



SF - 228

Total No. of Pages :2

Seat No.	
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T.E. (Computer Science and Engg.) (Semester - V)
Examination, November - 2017
SYSTEM PROGRAMMING
Sub. Code: 66294

Day and Date :Saturday, 11 - 11 - 2017

Total Marks : 100

Time :10.00 a.m. to 1.00 p.m.

- Instructions :**
- 1) Question No. 4 and 8 are compulsory.
 - 2) Answer any two questions from Question No. 1, 2 and 3.
 - 3) Answer any two questions from Question No. 5, 6 and 7.
 - 4) Figures to right indicate full marks.

Q1) a) Explain the fundamentals of language specification. [8]

b) Explain Pass I of a two pass assembler. [8]

Q2) a) State and discuss the advanced macro facilities with an example each. [8]

b) Discuss language processing activities in detail. [8]

Q3) a) List and discuss elements of assembly language programming. [8]

b) Explain different data structures of the macro preprocessor with its contents in detail. [8]

Q4) Write a short note on (6 marks each): [18]

- a) Macro Expansion.
- b) Intermediate Code Forms.
- c) LEX and YACC LPDT's.



P.T.O.

- Q5) a) Explain use of Interpreters. What are Pure and Impure Interpreters? [8]
 b) Explain code optimization in compilation. Brief about Local and Global code optimization. [8]
- Q6) a) Give the Structure of UI with neat diagram. [8]
 b) Write and Explain Linking Algorithm. [8]
- Q7) a) Explain about the Tools used in Enhancement of Program Performance.[8]
 b) What is Command Dialog? Explain ways to implement Command Dialogs. [8]
- Q8) Write a short note on: (Solve any three: each carries 6 marks.) [18]
 a) Program Development.
 b) Two passes of Linker.
 c) Program Relocation.
 d) Memory Allocation in Compilers.



SF-229

Total No. of Pages : 2

Seat No.	
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T.E. (Computer Science and Engineering) (Part - III)
(Semester-V) (Revised) Examination, November - 2017
OBJECT ORIENTED MODELING AND DESIGN (Theory)
Sub. Code : 66295

Day and Date : Tuesday, 14-11-2017

Total Marks : 50

Time : 9.30 a.m. to 11.30 a.m.

- Instructions :
- 1) All the questions are compulsory, Provided internal options in each question.
 - 2) Figures to the right indicate full marks.

Q1) Attempt any two questions out of three.

[7 × 2 = 14]

- a) Explain OMT models in detail.
- b) Explain the following terms
 - i) State generalization
 - ii) Control Flows
- c) Write note on - Design associations

Q2) Attempt any two questions out of three.

[6 × 2 = 12]

- a) Explain the following terms.
 - i) Generalization
 - ii) Class Descriptors
- b) Draw and explain Event trace diagram for ATM Scenario.
- c) Explain the impacts of Object Oriented Approach.



P.T.O.

SF-229

Q3) Attempt any two questions out of three.

[6 × 2 = 12]

- a) Explain Structural things of UML.
- b) Explain kinds of events with respect to behavioural modeling.
- c) Explain deployment diagram, its contents and uses.

Q4) Attempt any two questions out of three.

[6 × 2 = 12]

- a) Explain class diagram, its properties, contents and common uses.
- b) Explain following terms with respect to activity diagram.
 - i) Action states
 - ii) Transitions
 - iii) Branching
- c) Write a note on - frameworks.



Seat No.	
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SF - 231

Total No. of Pages : 2

T.E. (CSE) (Semester - V) (Revised)

Examination, November - 2017

NETWORK TECHNOLOGIES

Sub. Code : 66297

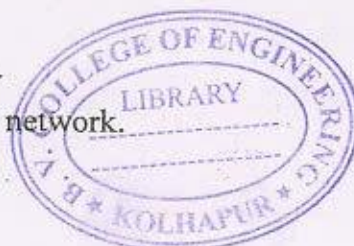
Day and Date : Wednesday, 22 - 11 - 2017

Total Marks : 50

Time : 9.30 a.m. to 11.30 a.m.

- Instructions :**
- 1) Question Number One is compulsory.
 - 2) Attempt any THREE questions from Question No. TWO to FIVE.
 - 3) Figures to the right indicate full marks.
 - 4) Assume data wherever necessary.

- Q1) a)** Explain issues in designing a MAC protocol for AD HOC Wireless Networks. [6]
- b)** Explain FCCH and SCH channels in GSM operation. [4]
- c)** What is VPN? Explain VPN protocols. [4]
- Q2) a)** What is GSM? Explain the role of HLR and VLR in GSM service operations. [6]
- b)** What is Handoff operations? Explain inter BSC handoff. [6]
- Q3) a)** What is WLAN? Explain various standards in WLAN defined by IEEE. [6]
- b)** Explain sensor network node architecture. [6]
- Q4) a)** Draw and explain Bluetooth piconet architecture. [4]
- b)** Explain WEP protocol. [4]
- c)** How sensor network is useful in environmental monitoring. [4]
- Q5) a)** What is location updating in GSM. Explain various steps involved in normal location updating. [6]
- b)** Compare WLAN and WPAN networks. [3]
- c)** Explain necessity of security in wireless network. [3]



Seat No.	
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T.E. (Computer Science and Engineering) - II (Semester - VI)
Examination, November - 2017
OPERATING SYSTEM - II
Sub. Code : 66859

Day and Date : Thursday, 02 - 11 - 2017

Total Marks : 100

Time : 2.30 p.m. to 5.30 p.m.

- Instructions :
- 1) Figures to the right indicate full marks.
 - 2) Solve any two questions from Q.1 to Q.3.
 - 3) Solve any two questions from Q.4 to Q.6.

- Q1)** a) Explain the architecture of UNIX System Kernel. [8]
b) Explain scenarios for retrieval of a buffer from the buffer cache. [10]
c) What is Inode? List Fields from disk inode. [7]
- Q2)** a) Calculate the Maximum size of a file in the UNIX system, if disk block size is 512 byte and a block is identified by 32 bit integer. [8]
b) What is remembered inode? How is it useful in inode assignment to a file? [8]
c) Explain Following System calls: [9]
i) Open.
ii) Read.
iii) Pipe.
- Q3)** a) Explain the use of User File Descriptor Table, File Table and Inode Table in UNIX File system. [8]
b) Explain bwrite algorithm. [7]
c) What is Super Block? List fields from the Super Block. [5]
d) Explain the structure of a directory file in UNIX. [5]

P.T.O.

- Q4)** a) Explain the context of a process. [8]
b) Explain the process state transition in UNIX. [8]
c) Explain the algorithm for handling the interrupt. [9]
- Q5)** a) What is a signal? Explain checking and handling of the signal. [8]
b) Explain the real and effective user ID of a process. [9]
c) Explain the process scheduling parameters in UNIX. [8]
- Q6)** a) Explain allocation of Swap space. [8]
b) Explain page stealer process. [8]
c) Explain switch table in device driver interface. [9]



Seat No.	
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T.E. (CSE) (Part -III) (Semester - VI) (Revised) (Theory)
Examination, November - 2017
DATABASE ENGINEERING
Sub. Code:66860

Day and Date :Friday, 03 - 11 - 2017
 Time :2.30 p.m. to 4.30 p.m.

Total Marks :50

- Instructions :
- 1) All the questions are compulsory. Provided internal options in each question.
 - 2) Figures to the right indicate full marks.

Q1) Attempt any two questions out of three

[2×7=14]

- a) Give advantages and disadvantages of DBMS
- b) Write SQL queries to perform given tasks on following schema

Sailors (sid: integer, sname: string, rating: integer, age: real)

Boats (bid: integer, bname: string, color: string)

Reserves (sid: integer, did: integer

- i) Find the names of sailors who have reserved at least one boat.
 - ii) Find the names of sailors who have not reserved a red boat.
 - iii) Find the name and age of the oldest sailor.
 - iv) Find the age of youngest sailor who is at least 18 years old.
- c) What is functional dependency? Give different types of functional dependencies.



P.T.O.

Q2) Attempt any two questions out of three.

[2×6=12]

- a) Compare database systems with traditional file based systems.
- b) Explain different Data Definition Language (DDL) Statements.
- c) Explain Third Normal Form and Boyce-Codd Normal Form.

Q3) Attempt any two questions out of three.

[2×6=12]

- a) What are the different physical storage media used for data storage?
- b) Explain Two-Phase Locking Protocol for Concurrency Control.
- c) Explain how records can be organized in files.

4) Attempt any two questions out of three.

[2×6=12]

- a) Compare Dense and Sparse indices
- b) Explain Optimistic Concurrency Control Mechanism.
- c) Explain Log-based Recovery Mechanism.

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SF - 234

Total No. of Pages : 2

Seat No.	
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T.E. (CSE) (Part - II) (Semester - VI) Examination, November - 2017

INFORMATION SECURITY

Sub. Code: 66862

Day and Date : Tuesday, 07 - 11 - 2017

Total Marks : 50

Time : 2.30 p.m. to 4.30 p.m.

- Instructions :**
- 1) Q.3 and Q.4 are compulsory.
 - 2) Solve any one out of Q.1, Q.2 and Solve any one out of Q.5, Q.6.
 - 3) Assume suitable data wherever necessary.

Q1) a) List & Explain the security services defined in X.800. [6]

b) Explain the DES encryption with neat block diagram. [6]

Q2) a) Explain the RSA algorithm. Perform encryption & decryption using RSA algorithm if $p=11$, $q=3$, $e=11$, $M=7$ [6]

b) What is Message Authentication Code? Explain generation of MAC based on DES. [6]

Q3) a) Compare [6]

i) Symmetric and Asymmetric ciphers

ii) Differential and Linear cryptanalysis

b) Explain Diffie-Hellman key exchange algorithm with example. [4]

c) Define the following terms w. r. t Avalanche effect: [3]

i) SIC

ii) BIC

iii) GA



P.T.O.

- Q4)** a) Explain in detail different approaches to Digital Signatures. [6]
b) What is certificate format in X.509 standard? [7]
- Q5)** a) Draw general format of PGP message and explain every field of it in detail. [6]
b) List types of firewalls. Explain any one in detail. [6]
- Q6)** Write a short note on any two. [12]
a) IPSec Authentication Header.
b) SET Participants.
c) Trusted System.



SF-233

Total No. of Pages : 3

Seat No.	
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T.E. (CSE) (Part - III) (Semester - VI) (New)

Examination, November - 2017

STORAGE NETWORKS

Sub. Code : 66861

Day and Date : Monday, 06-11-2017

Total Marks : 100

Time : 2.30 p.m. to 5.30 p.m.

- Instructions :**
- 1) Attempt any three questions from each section.
 - 2) Figure to the right indicate full marks.
 - 3) Assume suitable data wherever necessary.

SECTION-I

- Q1) a)** Explain the following in relation with Information Lifecycle. **[8]**
- i) Information Lifecycle Management (ILM).
 - ii) Information Lifecycle Management (ILM) Implementation.
 - iii) ILM Benefits.
- b) The average I/O size of an application is 128 KB. The following specifications are available from the disk manufacturer: average seek time = 2.5 ms, 7,200 RPM, transfer rate = 60 MB/s. Determine the maximum IOPS that could be performed with this disk for this application. Taking this case as an example, explain the relationship between disk utilization and IOPS. **[8]**

- Q2) a)** Describe SCSI Command Model in direct attached storage. **[8]**

OR

- a) Describe Fibre Channel Architecture. **[8]**
- b) Explain Benefits of Network Attached Storage[NAS]. **[8]**



P.T.O.

Q3) a) Describe FCIP, FCIP Topology and FCIP Performance and Security. [8]

- b) An application has 1,000 heavy users at a peak of 2 IOPS each and 2,000 typical users at a peak of 1 IOPS each, with a read/write ratio of 2: 1. It is estimated that the application also experiences an overhead of 20 percent for other workloads. Calculate the IOPS requirement for RAID 1, RAID 3, RAID 5, and RAID 6. [8]

Q4) Solve ANY TWO of the following questions.

a) Describe different RAID levels with its advantages and disadvantages.[9]

b) Explain Cache component of an Intelligent Storage System with following reference. [9]

i) Structure of Cache

ii) Read Operation with Cache

iii) Write Operation with Cache

iv) Cache Implementation

v) Cache Management

vi) Cache Data Protection.

c) Describe Data Center Infrastructure. [9]

SECTION-II

Q5) a) Explain Backup and Restore Operations. [8]

b) Describe BC Planning Lifecycle. [8]

Q6) a) Explain symmetric storage virtualization with its advantages and disadvantages. [8]

b) Describe BC Planning Lifecycle in business continuity. [8]

Q7) a) Explain Storage Virtualization on various levels of storage network. [8]

b) Describe various Backup purpose and backup considerations in storage networks. [8]

Q8) Solve ANY TWO of the following questions.

a) Explain Failure Analysis in BC, BC terminology and Business Impact Analysis. [9]

b) Explain implementation considerations in Storage virtualization. [9]

c) Describe different Backup Granularity and Recovery Considerations. [9]



Seat
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T.E. (CSE) (Part - III) (Semester - V) (Revised)

Examination, November - 2017

COMPUTER ALGORITHMS

Sub. Code: 66296

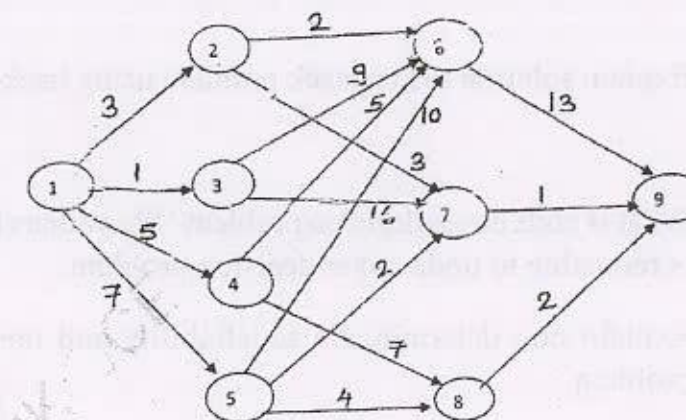
Day and Date : Monday, 20 - 11 - 2017

Total Marks : 100

Time : 10.00 a.m. to 1.00 p.m.

- Instructions :
- 1) Question No. 4 and 8 are compulsory.
 - 2) Attempt any four questions from remaining questions.
 - 3) Figures to the right indicate full marks.
 - 4) Assume suitable data wherever necessary.

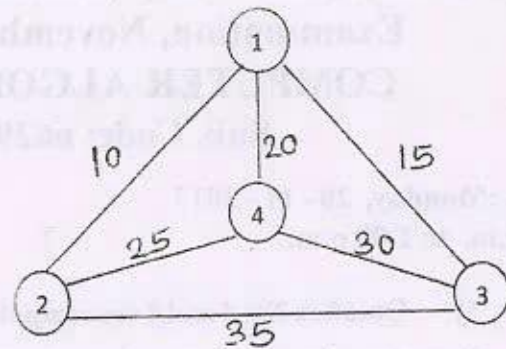
- Q1) a) Explain Job sequencing with deadlines. Also calculate the optimal solution for $n=5$ jobs, where profits $(p_1, p_2, p_3, p_4, p_5) = (100, 19, 27, 25, 15)$ and deadlines $(d_1, d_2, d_3, d_4, d_5) = (2, 1, 2, 1, 3)$. [8]
- b) Prove that complexity of quick sort in best case is $O(n \log n)$ and that in worst case is $O(n^2)$. [8]
- Q2) a) Give solution to Knapsack problem using greedy solution. [8]
- b) Find the minimum cost path from s to t in the multistage graph given below using forward approach. [8]



P.T.O.

SF - 230

- Q3) a) Solve the instance of Travelling sales person problem to find tour of minimum cost. [8]



- b) What is an Algorithm? What are the characteristics of the algorithm? [8]

Q4) Write short note on (Solve any three)

[18]

- Difference between Priori and Posteriori analysis.
- Randomized algorithms
- Knapsack 0/1
- Greedy Method

- Q5) a) Explain breadth first search and depth first search with suitable example. [8]

- b) Explain solution to knapsack problem using back-tracking. [8]

- Q6) a) What is node cover decision problem? Show that clique decision problem is reducible to node cover decision problem. [8]

- b) Explain non deterministic satisfiability and non deterministic clique problem. [8]

SF - 230

- Q7) a) What is deterministic list ranking problem in PRAM? Explain with example. [8]

- b) Explain prefix sum computation with the help of Mesh and Hypercube. [8]

Q8) Write short note on:

[18]

- Hamiltonian Cycle
- Articulation Point
- Butterfly network.

