FACULTY OF ENGINEERING

B.E III-Semester (CE/EE/Inst/CSE)(AICTE) (Main) Examination, December 2019

Subject: Essence of Indian Traditional Knowledge

Time: 3 Hours   **Max. Marks: 70**

Note: Answer all questions from Part –A, & answer any five questions from Part-B.

PART – A (20 Marks)

1. What is Civilization?

2. What is Sarvodaya?

3. How many Vedas-Explain?

4. Visistadvaita – Explain in Brief.

5. Satyagraha – its importance

6. Four noble truths

7. Indian handicrafts

8. Dance and Drama

9. Purusharthas – Explain Brief.

10. Meaning of Yoga and its essence.

PART-B (5 X 10 = 50 Marks)

11. a) What are the source of Indian Philosophy?
    b) Discuss the general characteristics of Culture?

12. a) Elucidate the central philosophical themes in Vedas and Upanishads?
    b) Write a note on Indian Languages and Literature?

13. a) Write a note on Buddhism?
    b) Discuss about the Brahma Samaj and Arya Samaj?

14. a) What is a Value? Explain the ethics issues of Information Technology?
    b) Explain the development of Indian Architecture?

15. a) What are the aims of Indian Education System?
    b) Explain the after Independence in Indian Education Committees/Commissions.

16. a) Write a note on E-learning education System?
    b) Discuss significance of ethics of War and Peace.

17. a) Elucidate Gandhiji conception of truth and non-violence?
   b) Explain Tagore's Religion of Man and Ideas on education?

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FACULTY OF ENGINEERING

B.E. III Semester (ECE/MP/AE/I.T) (AICTE) (Main) Examination, Dec. 2019

Subject: Effective Technical Communication in English

Time: 3 Hours   **Max. Marks: 70**

Note: Answer all questions from Part-A & any five questions from Part-B

PART-A (20 Marks)

1. How are visual aids useful? (2)
2. What is style? (2)
3. What is the importance of IOM? (2)
4. What are the formats of business letters? (2)
5. What is a progress report? (2)
6. How does feasibility report differ from progress report? (2)
7. What is user manual? (2)
8. Mention the types of manuals. (2)
9. Write any two aspects of presentation. (2)
10. Draw a flow chart showing the process of communication. (2)

PART-B (50 Marks)

11. a) Write about the salient features of technical communication. (5)

    b) What are the differences between general and technical communication? (5)

12. a) Discuss Email etiquette. (5)

    b) You are the instructor of a course in which 75 students have registered. Draft an email to be sent to all these students asking them to select a topic of their choice and prepare for a professional presentation of 10 minutes duration. (5)

13. a) What is evaluation report? Explain it with an example. (5)

    b) Fantasy Garments Corporation wants to open a new garment branch in a metropolitan city for all age groups, ranging from formals to casuals. You, as the Sales Manager of the company have to prepare a report on the set-up of the new showroom. (5)

14. a) What is a manual? Explain the different types of manual. (5)

    b) Write a set of guidelines about the specific features and usage of a mobile phone. (5)

15 a) Write about the different aspects of oral presentation. (5)
   b) Transfer the information from the following bar chart into the verbal mode. (5)
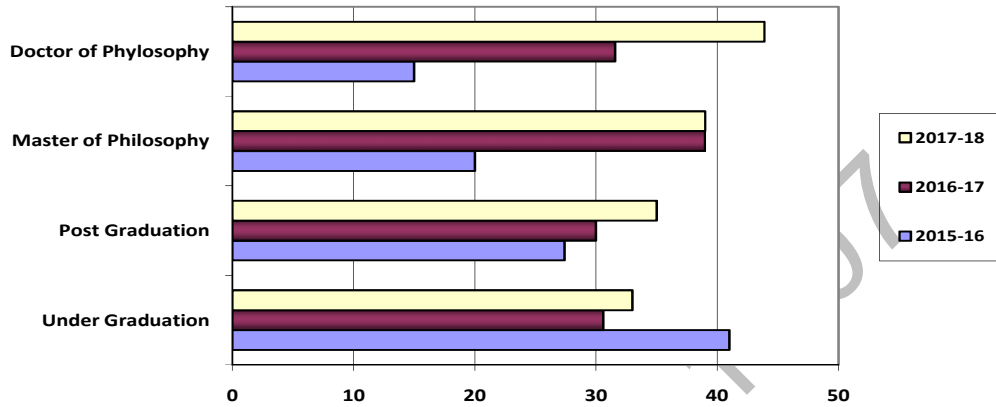
Educational qualification in India for three consecutive years

16 a) Write tips for writing an effective E-mail. (5)
   b) When do you use pie charts? Explain with an example. (5)

17 a) Draw a flow chart on preparation of your favourite dish/meal. (5)
   b) You want to take a car loan from State Bank of India. Write a letter to the
      Chief Manager, SBI Branch of your locality requesting him/her to send you all the
      information relating to car loans by SBI. (5)

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FACULTY OF ENGINEERING

B.E. III-Semester (CBCS) (Civil) (Backlog) Examination, December 2019

Subject: Building Materials & Construction

Time : 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part - A and answer any five questions from Part-B.

PART - A (20 Marks)

1. How are stones classified? (2)

2. What different classes of bricks? (2)

3. What are the uses of timber. (2)

4. What are the different grades of cement. (2)

5. What are the characteristics of good mortar? (2)

6. What are the various applications of coarse aggregates? (2)

7. Mention the uses of recycles aggregates. (2)

8. What do you mean by distemper? (2)

9. What is formwork? (2)

10. What do you mean by cracks in buildings. (2)

PART- B (50 Marks)

11 (a) What are the characteristics of good building stone? Explain in detail. (5)
   (b) Explain the process of burning of bricks in bull trench with a neat sketch? (5)

12 (a) What are the various types of cement. Explain in detail. (5)
   (b) How do you determine bulking of sand in the laboratory. (5)

13 (a) How industrial waste can be used for sustainable development. (5)
   (b) Explain in detail about green buildings. (5)

14 (a) What are the different types of plastering. Explain in detail. (5)
   (b) Explain the process of painting an old wood work. (5)

15 (a) Explain in detail the different types of material used in formwork. (5)
   (b) Explain in detail the different types of scaffolding. (5)

16 (a) Write the classification of fires and mention the causes of it. (5)
   (b) What are the various methods of damp proofing in building? (5)

17 (a) Explain the types of joints in concrete. (5)
   (b) What are the causes of cracks in buildings? Explain in detail (5)

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FACULTY OF ENGINEERING

B.E. (EE/Inst.) III - Semester (CBCS) (Backlog) Examination, December 2019

Subject : Digital Electronics and Logic Design

Time : 3 hours   **Max. Marks : 70**

Note: Answer all questions from Part-A. Answer any Five questions from Part-B.

PART – A (10 x 2 = 20 Marks)

1   Prove that the complement of the EX-OR function is equal to its dual.   2
2   Simplify the following expression using the postulates and theorems of Boolean
    algebra. AB + (AC)' + AB'C(AB+C).   2
3   Explain Tri-state TTL inverter circuit diagram.   2
4   Draw a pair, a quad, and an octet on K-map.   2
5   Why is ECL called non-satruating logic? What is the main advantage accruing from
    this?   2
6   Distinguish between demultilplexer.   2
7   Model a NAND based logic diagram of SR, FF.   2
8   Analyze the differences between latch and flip flop.   2
9   An 8 bit DAC produces V_{out} = 0.05 V for a digital input of 00000001. Find the full
    scale output. What is the resolution? What is V_{out} for an input of 0110101010?   2
10 Write the max terms corresponding to the logical expression Y = (A + B + C').   2

PART – B (5 x 10 = 50 Marks)

11 Minimize the following Boolean function using the Quine-McCluskey procedure :
    f(A, B, C, D, E) = Σm (0, 1, 2, 5, 9, 11, 12, 13, 27, 28, 29)   10

12 a) Draw the schematic and explain the operation of a CMOS inverter. Also explain
       its characteristics.   5
   b) Realize F = Σ(1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 15) using 8 to 1 mux.   5

13 a) Illustrate excess 3 to BCD code converter using minimum number of NAND
       gates.   5
   b) Design a 32 : 1 multiplexer using two 16 : 1 and 2 : 1 multiplexers.   5

14 a) Model a synchronous MOD-6 counter and explain with waveforms.   5
   b) Explain about serial-in, serial-out shift register.   5

15 a) Explain the working principle of tracking type ADC. Compare it over with digital
       ramp ADC.   5
   b) With the help of the neat diagrams explain the working of : Switched capacitor
       type DAC.   5

16 a) Create the design of a BCD to seven segment decoder with neat diagrams.   5
   b) Draw and explain the block diagram of a 4-bit adder to add contents of two
       registers.   5

17 a) Show how the following expression can be implemented as stated using only
       NOR gates :   5
       $X = AB\left[C\left(\overline{DE} + \overline{AB}\right) + \overline{BCE}\right]$
   b) Add -79 to +33 using the 8 bit 2's complement arithmetic.   5

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FACULTY OF ENGINEERING

B.E.(ECE) III-Semester (CBCS)(Backlog) Examination, December 2019

Subject: Network Analysis & Synthesis

**TIME: 3 Hours**   **Max. Marks : 70**

Note : Answer all questions from Part - A & any five questions from Part - B

PART - A (10 X 2 = 20 Marks)

1. Define the parameters of Symmetrical Network.

2. Explain the concept of Image impedance of a two port network.

3. Justify that m=0.6 for m-derived terminating half sections.

4. Design a Constant - k Low Pass T filter having a cut-off frequency of 4KHz and nominal characteristic impedance of 500 .

5. What are the applications of Equalizers.

6. Design a Lattice attenuator, if $Z_0 = 200$ and attenuation is 20 dB.

7. Obtain the pole zero plot of $) = \dfrac{s^2+4}{(s+2)(s^2+9)}$

8. What are the four possible ways of defining a Transfer Functions.

9. Mention any four properties of Hurwitz polynomial.

10. Explain the concept of removing a pole at infinity.

PART - B (5 X 10 = 50 Marks)

11.a) For a given L section find image and iterative impedances
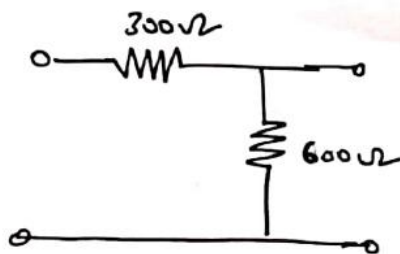
   b) Derive the expression for characteristic impedance of a symmetrical - network in terms of open and short circuit impedances.

12. a) Derive the conditions of Pass and Stop bands for a filter.
   b) Design m-derived T - type LPF to work into load of 500 and cut-off frequency of 4KHz and peak attenuation at 4.5KHz.

13. Design a Composite High Pass Filter to operate into a load of 600 and having a cut-off frequency of 1.2KHz. the filter is to have one constant - k section with f = 1.1KHz and suitable termination half section.

14. a) An Attenuator is composed of Symmetrical T-section having a series arm of 175 and a shunt arm of 350 . Find the characteristic impedance and attenuation.
   b) Derive the necessary conditions for a bridge - T - equalizer with a neat circuit diagram.

15. a) What are the restrictions on pole and zero locations for driving point functions And Transfer functions.

   b) Determine poles and zeros of the impedance function Z(S) in the network.
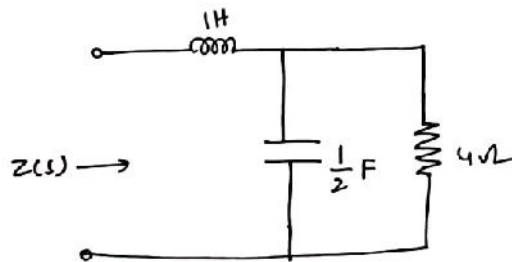
16. a) Obtain the Foster I form and Cauer I form of the RL impedance functions.

$$Z(S) = \frac{S(S+4)(S+8)}{(S+1)(S+6)}$$

   b) Realize the network having impedance function.

$$Z(S) = \frac{6S^3 + 5S^2 + 6S + 4}{2S^3 + 2S}$$

17. Answer any two of the following :

   a) Write the properties of LC and RC driving point Immitance functions.

   b) Explain about Asymmetrical L-Type attenuator.

   c) Derive an expression for the impulse response of an series RL circuit.

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FACULTY OF ENGINEERING
BE III Semester (CBCS) (A.E.) (Backlog) Examination, December 2019

Subject: Fluid Mechanics and Machinery

Time: 3 Hours   Max. Marks: 70

Note: Answer all questions from Part A, & any five questions from Part-B

PART – A (10 x 2 = 20 Marks)

1. How does the dynamic viscosity of liquid and gases vary with respect temperature?
2. Explain Newtonian fluid and non-Newtonian fluid.
3. An oil of specific gravity is 0.78 under pressure of 137 $\frac{N}{m^2}$. Find out the oil depth?
4. How to identify the Laminar and turbulent flow?
5. Differential manometer reading is 20 cm. (Assume sectional area of the pipe and throat respectively 1 m^2 and 0.8 m^2) determine the discharge.
6. Define Sub-laminar boundary layer.
7. Explain 'sudden expansion losses in flow through circular pipe.
8. How Iso-efficiency curves are plotted from operating curves?
9. What are the significance of vapour pressure in reaction turbine?
10. What is meant by kinematic and dynamic similarities?

PART – B (5 x 10 = 50 Marks)

11. An oil of viscosity 5 poise is used for lubrication between a shaft and sleeve. The diameter of shaft is 0.5m and it rotates at 200 RPM. Calculate power lost in oil for a sleeve length of 0.1m. The thickness of oil film is 0.1m.
    a) Explain vapour pressure.

12. Explain
    a. Stream function.
    b. Equipotential line
    c. Flow net
    d. Stream equation

13. The pressure difference ΔP in a pipe of diameter D and length L due to turbulent flow on velocity v, viscosity μ, density ρ, and roughness k. Using Buckingham's f = Theorem, obtain the expression for ΔP.

14. For the laminar flow through a circular pipe, prove that
    (a) Shear stress variation across the section of the pipe is linear
    (b) The velocity variation is parabolic.

15. A horizontal pipe line 40 m long is connected to a water tank, discharge freely into the atmosphere at the other end. For the first 25 cm of its length from the tank the pipe is 150 mm diameter and it is suddenly enlarged to 300 mm. The height of the water level in the tank is 8m above the center of the pipe and f = 0.01. Considering all losses of head which occur, determine the rate of flow, draw hydraulic gradient line and total energy line.

16. Inward radial flow reaction turbine works at 450 rpm. Under a head of 120 meters. Its diameters at inlet is 120cm and the flow area is 0.4m^2. The angle made by absolute and relative velocities at inlet is 20o and 60o respectively with tangential velocity. Determine
    a) the volume flow rate
    b) the power developed
    c) hydraulic efficiency   (assume whirl velocity at outlet zero)

17. Draw and discuss the main characteristic curves and operating curves of centrifugal pump.

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FACULTY OF ENGINEERING

B.E. III – Semester (CBCS)(I.T) (Backlog) Examination, December 2019

Subject: Digital Electronics & Logic Design

Time:3 Hours   **Max.Marks:70**

Note: Answer all questions from Part A & any five questions from Part-B.

Part – A (2 x 10 = 20 Marks)

1. Using algebraic manipulation prove that $(x+y)(x+y') = x$

2. Neatly draw the general structure of PAL

3. Explain the universal gates in detail.

4. What is a state table? Give an example

5. Write about D Flip flop   .

6. Distinguish between Moore and Melay state model.

7. Explain dynamic hazard with example

8. What are the applications of shift registers

9. Define Clock skew and hold time of a Flip – Flop

10. Explain behavior of Asynchronous Sequential Circuits

PART – B (5 x 10 = 50 Marks)

11. Find the minimum cost SOP forms for the function
    $f(x_1, x_2, x_3, x_4) = \sum m(1, 4, 5,6,7,10,11,14)$, draw the logic circuit using NAND
    gate alone. Write VHDL code for the above function.   (10)

12. a) With the neat diagram explain general structure of PLA.   (5)
    b) Write about code converters in support with an example.   (5)

13. (a) Draw J-K flip flop using NAND gates and explain its operation   (5)
    (b) Define Gated SR latch, Gated D latch with neat circuit diagram   (5)

14. Explain FSM as an Arbiter circuit.   (10)

15. Write short notes on the following
    (a) Clock Synchronization   (5)
    (b) Asynchronous Sequential Circuits   (5)

16. (a) Explain about state assignment problem in detail   (5)
    (b) Write about Formal model of synchronous sequential circuits.   (5)

17. (a) Design a circuit using FSM that meets the following specification: (7)
    i) The circuit has one input w and output z
    ii) All changes in the circuit occur on the positive edge of a clock signal
    iii) Output z is equal to 1 whenever the sequence 1010 is deleted. Otherwise the
    value of z is equal to 0.
    (b) Explain in detail about the behavior and analysis of asynchronous sequential
    circuits using an example.   (3)

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FACULTY OF ENGINEERING

B.E. 2/4 (Except ECE/I.T.) I Semester (Backlog) Examination, December 2019
Subject: Mathematics-III

Time: 3 hours   Max. Marks: 75

Note: Answer all questions from Part-A & answer any five questions from Part-B.
PART – A (25 Marks)

1. From the partial differential equation (by eliminating the constants) from the equation
   z= $f(x^2 - y^2)$. [2]
2. Solve $(p^2 + q^2)y = qz$ where

   $p = \dfrac{\partial z}{\partial x}, q = \dfrac{\partial z}{\partial y}$. [3]

3. State the Dirichlet's conditions for the Fourier expansion of [2]
4. Express $f(x) = x$ as a half-range *sine* series in $0 < x < 2$. [3]
5. State Baye's theorem. [2]
6. In a lottery, 'm' tickets are drawn at a time out of 'n' tickets numbered from 1 to n. Find the expected value of the sum of the numbers on the tickets drawn. [3]
7. What is small sample and large sample? [2]
8. Write lines of regression. [3]
9. State mean derivation from the mean and r^{th} moment about the mean. [2]
10. Write the normal equations to fit the parabola by the method of least squares. [3]

PART – B (5 x 10 = 50 Marks)

11. Solve $(D^2 + 2DD' + D'^2 - 2D - D^{2'})z = \sin(x + 2y), D\dfrac{\partial z}{\partial x}, D' = \dfrac{\partial z}{\partial y}$ [10]

12. Find the Fourier series for $\begin{cases} -1, & -f < t < -f/2 \\ 0, & -f/2 < t < f/2 \\ 1, & f/2 < t < f \end{cases}$ [10]

13. A tightly stretched string of length 'l' with fixed ends is initially in equilibrium positive. It

    is set vibrating by giving each $\dfrac{v_0 \sin^3 fx}{l}$ find the displacement of *u(x, y).* [10]

14. There are three bags, first containing 1 white, 2 red, 3 green balls; second contains 2 white, 3 red, 1 green ball and third contains 3 white, 1 red, 2 green balls. Two balls are drawn from a bag chosen at random. These are found to be one white and one red. Find the probability that the balls so drawn from the second bag. [10]

15. Show that 95% confidence limits for the mean   of the population are $\bar{S} \pm \dfrac{\dagger_3}{\sqrt{n}} t_{0.05}$

    .Deduce that for a random sample of 10 values with mean 41.5 inches and the sum of the squares of the derivations from the mean 135 inches^2 and drawn of a normal population, 95% confidence limits for the mean of the population are 39.9 and 43.1 inches. [10]

16. While calculating correlation coefficient between two variables, *x and y* from 25 pairs of observations, the following results were obtained:
    , $\sum x = 125, \sum x^2 = 650, \sum y = 100, \sum y^2 = 460, \sum xy = 508.$ Later it was
    discovered at the time of checking that the pairs of
    values were copied as

                                                                                                ….2

x	y
8	12
6	8

   Obtain the correct value of correlation coefficient.   10

17. Predict the mean radiation dose at an altitude of 3000 feet by fitting an exponential
    curve to the following given data: 10

Altitude(*x*):	50	450	780	1200	4400	4800	5300
Dose of radiation(*y*):	30	32	36	57	58	69	28

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FACULTY OF ENGINEERING

B.E. 2/4 (ECE) I Semester (Backlog) Examinations, December 2019

Subject: Applied Mathematics

Time: 3 Hours   **Max. Marks: 75**

Note*:* Answer all questions from Part-A, **& any five questions from Part-B.**

PART – A (25 Marks)

1. Form the partial differential equation by eliminating the arbitrary function from
   $z = (x + y)\{ (x^2 - y^2)$.   3

2. Solve $p(1 + q) = qz$.   2

3. Show that $f(z) = |z|^2$ is not analytic at any point.   3

4. Prove that $\int_c \frac{dz}{z - a} = 2fi$.   2

5. State Residue theorem.   2

6. What type of singularity have the function $f(z) = \frac{1}{1 - e^z}$.   3

7. Find the missing term from the following table   2

x	2	4	6
f(x)	8	-	24

8. Derive Euler's method to solve $\frac{dy}{dx} = f(x, y), y(x_o) = y_o$ 3

9. Show that the correlation coefficient is the geometric mean of the regression
   coefficients.   3

10. Write the lines of regression of x and y and y on x.   2

PART – B (50 Marks)

11. (a) Solve $(mz - ny)\frac{\partial z}{\partial x} + (nx - lz)\frac{\partial z}{\partial y} = ly - mx$.   5

    (b) Solve $(p^2 + q^2)y = qz$ using Charpit's method.   5

12. (a) Find the analytic function whose real part is $e^{2x}(x\cos 2y - y\sin 2y)$ 5

    (b) Evaluate $\oint_c \frac{z^2 + 1}{z(2z + 1)} dz$, where C is $|z| = 1$ 5

13. (a) Find the Laurent's expansion of $f(z) = \frac{7z - 2}{(z + 1)z(z - 2)}$ in the region $1 < |z + 1| < 3$.   5

    (b) Find the bilinear transformation which maps the points $z = 1, i, -1$ onto the points
        $w = i, 0, -i$.   5

14. (a) Using Newton-Raphson method, find the real root of $x \log_{10}^{x} = 1.2$ correct to five decimal places.   5

    (b) Apply Runge - Kutta 4th order method to find an approximate value of y when $x = 0.2$ given that $\dfrac{dy}{dx} = x + y$ and $y = 1$ when $x = 0$.   5

15. (a) By the method of least square, fit the straight line for the following data: 5

x	50	70	100	120
y	12	15	21	25

    (b) Find the correlation coefficient for the following data: 5

x	1	2	3	4	5
y	2	5	3	8	7

16. (a) Find the number of men getting wages of Rs.10 from the following table   5

Wages(Rs.)	5	15	25	35
No. Of Men	9	30	35	42

    (b) Evaluate $\oint\limits_{c} \dfrac{e^{z}}{\cos f\ z}\, dz$ where C is unit circle $|z| = 1$.   5

17. (a) Find the coefficient of rank correlation for the data   5

x	1	6	5	10	3	2	4	9	7	8
y	6	4	9	8	1	2	3	10	5	7

    (b) Evaluate $\oint\limits_{c} \dfrac{z-3}{z^{2}+2z+5}\, dz$ where C is the circle

    i) $|z+1-i| = 2$ ii) $|z+1+i| = 2$ 5

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FACULTY OF ENGINEERING
B.E. 2/4(I.T.) I Semester (Backlog) Examination, December 2019
Subject: Discrete Mathematics

Time: 3 hours   **Max Marks: 75**

Note: Answer all questions from Part-A and any five questions from Part-B

PART – A (25 Marks)

1. Use truth table to verify the equivalence $p \vee (p \wedge q) \Leftrightarrow p$. (2)

2. Determine whether the integers 10,17 and 21 are pairwise relatively prime. (3)

3. Find the hexadecimal expansion of $(177130)_{10}$. (2)

4. Find the GCD of 414 and 662 using the Euclidean algorithm. (2)

5. Give an inductive definition of the factorial function $F(n)=n!$. (3)

6. What is the minimum number of students in class to be sure that at least six will receive the same grade ,if there are five possible grades A,B,C,D,and F (2)

7. Construct the Hasse diagram for the poset $(\{1,2,3,4\},\ )$. (3)

8. Define a bipartite graph and give an example. (3)

9. Define a minimum spanning tree. Give an example. (2)

10. What is the value of the postfix expression 723*-4 93/+? (3)

PART – B (50 Marks)

11. a) Show that $p \vee (q \wedge r)$ and $(p \vee q) \wedge (p \vee r)$ are logically equivalent without using truth table method. (5)

    b) Show that the function $f: Z+ \to Z +$ defined by $f(x)=x2$ is invertible. (5)

12. a) Use mathematical induction to show that $1+2+2^2+\ldots+2^n=2^{n+1}-1$ for all non negative integers n. (5)

    b) Give a recursive version of binary search algorithm. How do you prove a recursive algorithm correct? (5)

13. Define Binomial Theorem and find Co-efficient of $a^{17}b^{23}$ in $(2a-6b)^{40}$ (10)

14. a) Find an explicit formula for the Fibonacci numbers. (5)

    b) Find all the solutions of the recurrence relation $a_n=3a_{n-1}+2n$. What is the solution with $a_1=3$? (5)

15. a) Find whether the graphs G and H are isomorphic. (6)
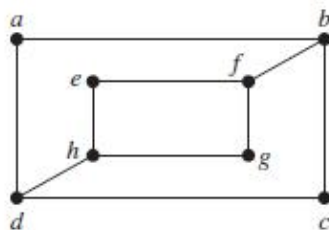
Fig. 1   G   H
                                 Fig.2
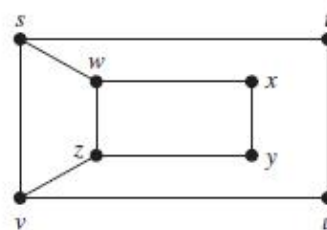
    b) What is Graph Coloring and give it applications? (4)

16. a) Write the procedure for depth first search and explain how to find a spanning tree for a graph using depth first search. (6)

    b) Give applications of Trees? (4)

17. Explain Prim's algorithm to find a minimal spanning tree with an example. (10)

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