PURBANCHAL UNIVERSITY
2022

Bachelor in Information Technology (B.I.T.)/Second Semester/*Final*

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT153HS: Discrete Structure *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1(a) What is Logic? What are propositions? Differentiate between Tautology and Contradiction with examples. Draw a truth table for $(p \rightarrow q) \wedge (\sim q \rightarrow \sim(\sim p))$. 2+4+6

2. What is mathematical induction? By mathematical induction, show that $1^2 + 2^2 + 3^2 + \dots + n^2 = \frac{n(n+1)(2n+1)}{6}$. 2+10

3(a) Differentiate between deterministic finite automata and non-deterministic finite automata. 6

(b) Design a DFA that accepts set of binary strings having odd number of zeros and odd number of ones. 6

Group B

Answer SEVEN questions. **7×8=56**

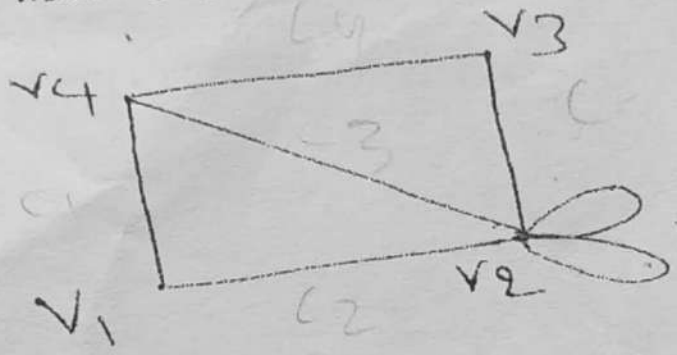
4. Discuss about basic principle of counting. Each user on a computer system has a password which is eight characters long, where each character is an uppercase letter or a digit. Each password must contain one digit followed by seven alphabets. How many passwords are possible when repetition is allowed? 2+6

5. What is combination? In how many ways a committee of 7 people be formed, consisting of 4 men and 3 women from a group of 10 men and 8 women? 2+6

6. Use Warshall's algorithm to find the transitive closure of the relation R= {(1,2), (1,3), (1,4), (2,3), (2,4), (3,4)}.

7. State Pigeonhole principle. Show that if any eight positive integers are chosen, two of them will have the same remainder when divided by 7. 2+6

8. What is graph? Find the degree of vertex of the graph. 2+6



9. Discuss union, intersection, and difference of two sets with example.

10. What is relation? Discuss reflexive, symmetric and transitive relation with examples. 2+6

11. Define recurrence relation. Find the solution of recurrence relation of $a_n = 5a_{n-1} - 6a_{n-2}$ with $a_0=5$ and $a_1=7$. 2+6

PURBANCHAL UNIVERSITY
2022

Bachelor in Information Technology (B.I.T.)/Second Semester/*Final*

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT155MS/BIT191MS/BIT125MS: Financial Management & Accounting *(New/Old)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1. Explain why wealth maximization objective is superior to profit maximization objective.

2. Following are the net cashflows of two mutually exclusive projects A and B.

Year	0	1	2	3	4	5
Project A	(10,000)	3000	3000	3000	3000	3000
Project B	(10,000)	3000	4000	2000	4000	3000

Which project would you recommend for investment? (Use PBP and NPV chiteria and assume cost of capital as 10%)

3. Following is the trial balance of a trading company as on 31st Dec. 2020.

Debit items	Amount	Credit Items	Amount
Purchases	120,000	Capital	200,0000
Discount allocated	5000	Scale	200,000
Wages	20000	Creditors	70,000
Salaries	50,000	Discount Received	30, 000
Selling expenses	5000		
Adm. Expenses	10,000		
Building	100,000		
Furniture	50,000		
Debtors	50,000		
Cash	90,000		
	500,000		500,000

Adjustments

(a) Closing stock valued Rs 30,000

(b) Depreciate Building and Furniture by 20% and 10% respectively

(c) Wages outstanding Rs 2000

(d) Salary includes Rs 10,000 paid as advance.

Required: Trading, profit and loss A/c and Balance sheet for 2020.

Group B

Answer EIGHT questions. **8×7=56**

4. Following are the net cash flows of a project:

Year	0	1	2	3	4	5
Net cash flows	(1000)	200	300	400	300	200

Required: Internal rate of return of the project.

5. Following information provided:

Year	1	2	3	4	5
Cash flows	(1000)	2000	3000	4000	5000

Required: Future value at the end of year 5 (assume I = 10%pa)

6. Journalize the following transactions:

(a) Purchased goods for cash Rs 10000

(b) Cash sales Rs. 8000

(c) Cash deposited into bank Rs 6000

(d) Purchased furniture from Hari Rs. 10,000

(e) Paid for salaries Rs. 10,000 and wages Rs 5,000

7. Following information provided:

Annual requirement = 18000 units.

Ordering cost = Rs. 100 per order

Carrying cost = Rs 10 per unit per year

Required: EOQ, no. of orders average stock level and total cost of EOQ.

8. Describe the types of the dividend policy of a firm.
9. Describe the steps of preparation of cash flow statement under direct method.
10. Point out the uses and limitations of ratio analysis.
11. Write down the rules of double entry-equation rule and types of account rule.
12. Describe the various types of costs encountered while managing receivable by a firm.
13. Describe the various factors influencing the working capital requirements of a firm.

PURBANCHAL UNIVERSITY
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Bachelor in Information Technology (B.I.T.)/Second Semester/*Final*

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT152CO/BIT173CO/BIT123CE: Digital Logic *(New/Old Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1(a) Why NAND and NOR gates are called Universal gate? Explain. 6

(b) What is shift register? Explain SISO with logic and timing diagram. 6

2(a) What is PLA? Explain block diagram of PLA. 6

(b) Simplify the Boolean expression considering the following equation. 6

f(A, B, C, D) = E{1,2,4,6,7,12} and d(A, B, C, D) = E{0, 3, 5, 8}

3. What is counter? What are the different applications of counter? Explain MOD-8 Asynchronous counter with timing diagram. 2+3+7

Group B

Answer SEVEN questions. **7×8=56**

4. What do you mean by multiplexer? Design 4×1 MUX with its operational table and logic circuit diagram. 2+6

5. Perform the following operation:

(a) $(1100110)_2$-$(1111011)_2$ using 2's complement.

(b) $(111110)_2$-$(1111011)_2$ using 1's complement.

(c) $(526)_{10}$-$(256)_{10}$ using 9's complement.

(d) Divide $(101101)_2$ by $(100)_2$. 2+2+2+2

6. What are the procedure for designing a circuit? State and prove Demorgan's theorem. 3+5

7. Define combinational circuit. Explain full-subtractor in detail. 2+6

Contd...

8. Construct 4×16 decoder by using 3×8 decoder and explain its working principle in detail.

9. What is sequential circuit? Differentiate between combinational and sequential circuit. Explain master and slave flip-flop. 2+2+4

10. Define flip flop. Explain about J-K flip flop with its logic circuit diagram, characteristics table, characteristic equation and excitation table. 2+6

11. Discuss and design seven segment decoder. Explain ROM. 5+3

12. Write short note on(Any TWO:

(a) BCD

(b) Integrated circuits

(c) Triggering of flip flop

PURBANCHAL UNIVERSITY
2021

Bachelor in Information Technology (B.I.T.)/Second Semester/*Final*

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT102SH: Mathematics-II *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×10=20**

1. Find the solution of the differential equation $(x+1)dy+(y-1)dx=0$.

2. Find the inverse Laplace transform of $\frac{1}{s^2+3s+2}$.

3. Express f(z)=log z in the form u(x,y)+i v(x,y).

4. Find the Fourier expansion of the function in the interval $0 \le x \le 2\pi, f(x)=2x$.

5. Find the general solution of the partial differential equation ap+bq = c.

6. Evaluate $\int_C f(z)dz, when f(z)=\frac{1}{z-a}$, c is the circle with centre at a and radius r.

7. Calculate the residue of (Z)= $f(z)=\frac{1}{z+\frac{1}{z}}$.

8. Find the Laplace transform of $e^{3t}\cos 2t$.

9. Find the general solution of the differential equation $\frac{d^2y}{dx^2}-2\frac{dy}{dx}+2y.=0$.

10. Define fourier cosine and sine integral of f(x).

Contd. ...

Group B

Answer EIGHT questions. **8×5=40**

11. Solve the differential equation: $\frac{dy}{dx} = \frac{2xy}{x^2 - y^2}$.

12. Solve the second order differential equation $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 4y = e^x \sin x$.

13. Solve $xdy - ydx = \sqrt[x]{x^2 + y^2}dx$.

14. Find the Laplace transform of $t\, e^{-t} \cos t$.

15. Find the inverse Laplace transform of $\frac{2s+3}{(s-1)(s-2)(s-3)}$.

16. Expand the function $f(x) = x^2, 0 \le x \le \pi$ in a Fourier cosine series and deduce that $\sum_{n=1}^{\infty} \frac{1}{x^2} = \frac{\pi^2}{6}$.

17. Verify Cauchy Riemann equations for the following function $e^x(\cos y + i \sin y)$.

18. Obtain the Laurent Series for $f(z) = \frac{1}{(1-z)(z+2)}$ in the domain $1 < |z| < 2$.

19. Solve the partial differential equation $p^2+qy-z = 0$.

Group C

Answer TWO questions. **2×10=20**

20. Solve the differential equation by the method of Laplace transform

$$\frac{d^2y}{dt^2} + 2\frac{dy}{dt} + 5y = e^{-t}\sin t,\ y(0) = 0,\ y'(0) = 1$$

21(a) Find an analytic function f(z) = u+iv, if u = e^xsiny.

(b) Find the fourier sine integral of the function

$$f(x) = x^2 \quad for \quad 0 < x < b$$
$$= 0 \quad for \quad x > b$$

22. Obtain the general solution of wave equation $\frac{\partial^2 u}{\partial t^2} = c^2 \frac{\partial^2 u}{\partial x^2}$. using variable separation method.

PURBANCHAL UNIVERSITY
2021

Bachelor in Information Technology (B.I.T.)/Second Semester/*Final*

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT191MS: Financial Management & Accounting *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1. Discuss the importance and objectives of financial management. Why is wealth maximization goal is considered to be superior than profit maximization goal.

2. A company is considering two mutually exclusive projects A and B. Both projects initial cash outlay and regular cash inflow are given below:

Year	Project A	Project B
0	(100,000)	(100,000)
1	30,000	30,000
2	30,000	40,000
3	30,000	20,000
4	30,000	10,000
5	30,000	40,000

Calculate:

(a) Payback period for both projects.

(b) Net present value for both project, going interest rate @ 14%.

(c) Which project would you select as per your above calculation?

3. From the following Trial Balance of ABC Trader for the year ended 30th Chaitra 2075 is given below:

(2)

Particulars	Dr. (Rs.)	Cr. (Rs.)
Opening Stock	1,50,000	
Purchase	8,00,000	
Carriage inward	22,000	
Wages	80,000	
Sales Return	10,000	
Salary	2,50,000	
General Expenses	15,000	
Printing & Stationery	25.000	
Insurance premium	5,000	
Advertisement	30,000	
House Rent	40,000	
Machinery	2,00,000	
Furniture	170,000	
10% Investment	1,50,000	
Debtors	1,20,000	
Cash Balance	156,000	
Building	6,50,000	
Sales		16,00,000
Purchase Return		15,000
Creditors		2,50,000
Capital		8,00,000
Interest Received		8,000
5% Debentures		200,000
Total	**28,73,000**	**28,73,000**

Additional Information:

(i) Closing stock at the end of Chaitra of Rs. 2,00,000

(ii) Depreciate machinery and furniture at 15% and 10% respectively.

(iii) Further bad debts of Rs. 5,000 and create provision for bad debts on debtors at 5%

(iv) insurance premium expired to the extent of Rs. 2,000

(v) Wages outstanding Rs. 10,000

Required:

(i) Trading Account

(ii) Profit and Loss Account

(iii) Balance Sheet

Group B

Answer EIGHT questions. **8×7=56**

4. "Financial Management is equally important to both manufacturing and service rendering organization" why?

5. Explain about different types of dividend distribution policy of an organization.

6. What is business entity concept? Why is it important?

7. Describe the factors effecting the working capital requirement of a firm.

8. Describe the factors affecting capital structure policies of a firm.

9. The following transaction are given:

Jan I Sold goods to Shital for Rs. 60,000

Jan 10 Shital returned Rs. 5000 worth of goods being defective.

Jan 12 Sold goods for cash to Shital Rs. 40,000

Jan 17 Received from Shital Rs. 53,000 in full settlement

Jan 21 Received Rs. 20,000 on account from her.

Jan 31Received information that Shital become insolvent and only 50 paise in every rupee was realized.

Required: *(i) Journal entries*

(ii) Shital Account and Cash Account

10. Following transactions are given:

Chaitra 1: Cash balance Rs. 40000 and bank balance Rs. 90000

Chaitra 3 : Goods sold for Rs. 30000 and received cash Rs. 10000 and cheque Rs. 19500 in full settlement

Chaitra 10 : Cash deposited into bank Rs. 12000

Chaitra 16 :Cash paid to Ram Rs. 4500 alter deducting 10% discount

Chaitra 25 :Goods purchased for Rs. 5000 and received 10% discount.

Chaitra 30 : Salary paid Rs. 6000

Chaitra 30 : withdrew from bank of Rs. 10,000 including 2,000 for private use.

Required: Triple Column Cash Book with cash, Bank and discount

11. Following information is given to you.

a. Jestha 1. Opening balance of stock of 1000 units @ Rs. 6

b. Jestha 5. Purchase 500 units @ Rs. 7.

c. Jestha 10. Issued 1200 units.

d. Jestha 15. Return to store 50 units.

e. Jestha 20. Purchased 1000 units @ Rs.8.

f. Jestha 22. Issued 1150 units.

g. Jestha 23. Purchased 500 units @ Rs. 9

h. Jestha 25. Purchased 300 units @ Rs. 10.

i. Jestha27. Issued 1250 units

j. Jestha 28. Defective goods returned to vendor of 30 units.

k. Jestha 29. Stock verifier found shortage of 20 units.

Required: store ledger Account under FIFO Method

12. Write short notes on any TWO:

(a) Annuity (b) Cash flow statement (c) Ratio analysis

PURBANCHAL UNIVERSITY
2021

Bachelor in Information Technology (B.I.T.)/Second Semester/*Final*

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT176CO: Object Oriented Programming in C++ *(New course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1(a) Write a program to create a class named Employee_Info with data membe Emp_Id and Emp_Name. Create another class named Finance_Info from Employee_Info with data member Bas _sal and Ot_sal. Create an independent class Extra _allowances with data Member Tray_All, House _All and Dail All. Now, derive another class named Total_Info from Finance_Info and Extra_allowances with data member Tot_Sal. Make necessary function for the above and show the Gross Salary. 8

(b) Discuss Function Overloading with example. 4

2(a) What is constructor and what are the properties of constructor? Write a program showing the example of Parameterized Constructor. 4+4

(b) In what circumstances we need to use Exception Handling Mechanism. Discuss with example. 4

3(a) List different types operators which cannot be overloaded? WAP to read two strings and concatenate them showing the example of operator overloading. 1+5

(b) What are the different types of Visibility modes used in Inheritance? Discuss. 6

Group B

Answer SEVEN questions. **7×8=56**

4. What is a template and why do we use Template in OOP? WAP to swap to variables using Function Template. 3+5

5. What is inheritance? List different types of Inheritance supported in C++. Write an OOP showing multiple inheritance. 3+5

6. Write a program to create a file named "cdplayer.dat" and store cd_id, NameofCd and price of N no. of cd player to the file and read the information from the file and display them. 8

7. What are the different types of type conversion possible in operator overloading? Write a program showing the example of basic to class type conversion. 2+6

8. What is DMA in C++? Write a program showing the example of new and delete operator. 2+6

9. What is Virtual function? Write a program showing the example of virtual function. 2+6

10. What are the different ways of defining members of a class? Discuss with example. How Encapsulation is achieved in C++? 4+4

11. **Write short notes on any TWO:** **2×4=8**
    (a) Early vs Late Binding
    (b) POP vs OOP
    (c) Name spaces

PURBANCHAL UNIVERSITY
2021

Bachelor in Information Technology (B.I.T.)/Second Semester/*Final*

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT173CO: Digital Logic *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

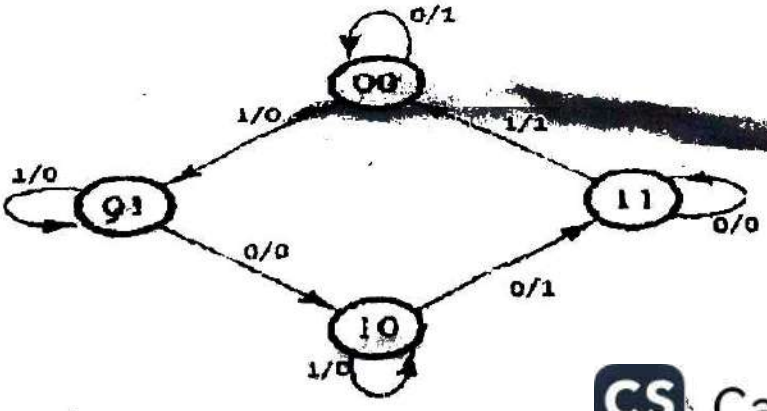
Answer TWO questions. **2×12=24**

1. Design the 4 bit Synchronous up-down counter with timing diagram, logic diagram and truth table.
2. What is master slave flip-flop? Design its logic circuit, truthtable and explain the working principle.
3. Design a4bit magnitude comparator.

Group B

Answer SEVEN questions. **7×8=56**

4. Design a full subtractor circuit.
5. Describe the three variables K-map with example.
6. Design 3 to 8 line decoder.
7. State and prove DE Morgan's theorems.
8. What do you mean by the register? What are the various types of registers?
9. Explain the 4 bit ripple counter and draw a timing diagram.
10. Differentiate between a MUX and a DEMUX using suitable diagrams.
11. Design sequential circuit for given state diagram.



PURBANCHAL UNIVERSITY
2021

Bachelor in Information Technology (B.I.T.)/Second Semester/*Final*

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT130EC: Electronic Devices & Circuits *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1(a) Draw a circuit diagram of a bridge full wave rectifier and explain its operation with waveforms. 8

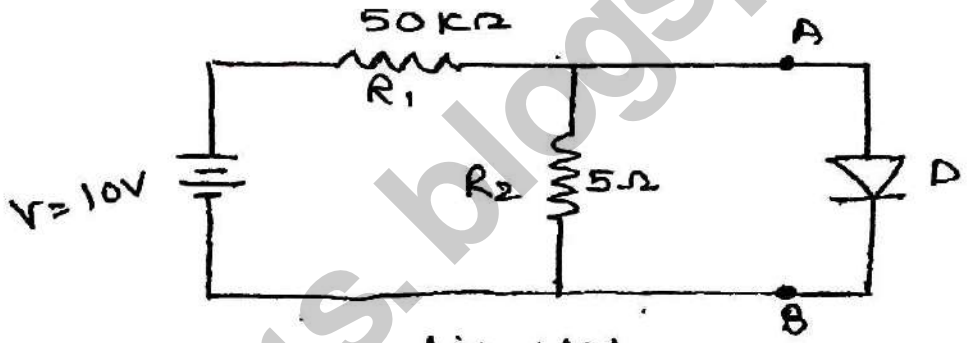


fig 1(a)

(b) Find the current through the diode in the circuit shown in fig. 1(a). Assume the diode to be ideal. 4

2(a) Draw the circuits of a transistor amplifier in CB, CE and CC configurations. Compare the characteristics of these configurations. 8

(b) Fig 2(b) shows a silicon transistor biased by feedback resistor method. Determine the operating point. Given that β=100. 4

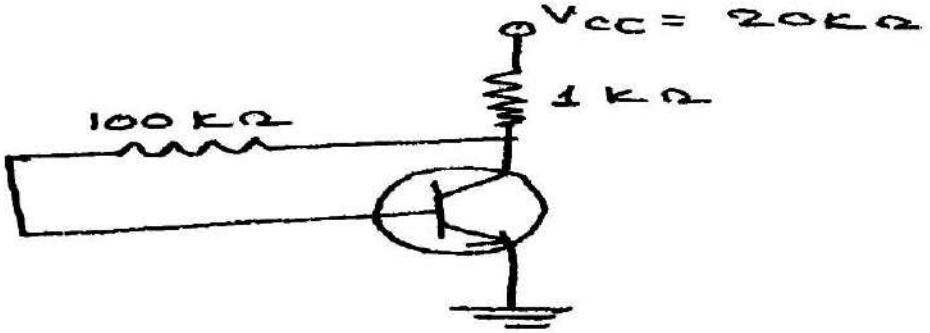


fig 2(b).

3. What is feedback in amplifiers? What is Barkhausen criterion for the feedback oscillator? Explain the working of a weinbridge oscillator with necessary diagram. 2+2+8

Group B

Answer SEVEN questions. **7×8=56**

4. List and explain the various voltage and current controlled sources.

5. Explain about application of diode as half wave and full wave rectifier.

6. What do you understand by transistor biasing? What is its need?

7. Explain the construction and working of an N channel E MOSFET.

8. A JFET has a drain current of 5 mA. If I_{DSS} = 10 mA and $V_{GS(off)}$ is -6 V, find the value of (i) V_{GS} and (ii) V_p.

9. What are the characteristics of an ideal op amp? Explain how an op amp can be used as an integrator.

10. Derive the expression for gain of an inverting and non inverting op amp.

11. Write short note on any TWO: 2×4=8

(a) Forward and Reverse transfer function

(b) Voltage divider biasing method for BJT

(c) Clipping circuit

2019

Bachelor in Information Technology (B.I.T.)/Second Semester/*Final*

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT102SH: Mathematics-II *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer ALL questions. **10×2=20**

1. Solve $\frac{dy}{dx} = 3x^2$.
2. Solve $p^2 - 3p + 2 = 0$.
3. Find the Laplace transform of $\frac{\cos 2t}{t}$.
4. Find the residue of $\frac{z}{z^2 - 5z + 6}$ at $z = 3$.
5. Express in Taylor's series of cosz.
6. Define the fourier series ~~of the given funcyion~~.
7. State Cauchy Riemann equation for a analytic function f(z).
8. Test whether (2x - 3y) dx - 3xdy = 0 is exact or not.
9. Write one dimensional heat and wave equation.
10. Define Laplace transform.

Group B

Answer all questions. **8×5=40**

11. Solve $(D-4)^2 y = e^{4x}$.
12. Solve $\frac{dy}{dx} + \frac{2x}{x^2+2} y = \frac{1}{x}$.

Contd. ...

13. Find the laplace transform of $\left(\frac{1-\cos t}{t}\right)$.

14. Find the inverse laplace transform of $\frac{s+1}{(s+2)(s^2+2)}$.

15. Express $f(x)=x-x^2; \pi \le x \le \pi$. in fourier series.

16. Show that by fourier sine integral of $e^{-x}\cos x$ is $\int_0^\infty \frac{w^3 \sin wx}{w^4+4} dw$

$= \pi/2\, e^{-x}\cos x$.

17. Express $f(z)=\frac{1}{z^2-3z+2}$ in Laurents series in the region $1<|z|<2$.

18. Show that the function $u(x,y)=3x^2y+x^2-y^3-y^2$ is harmonic function. Find its harmonic conjugate.

Group C

Answer all questions. **2×10=20**

19. Solve using Laplace Transform

$2y''+5y'+2y=e^{-2t}; y(0)=1; y'(0)=1.$

20. A homogeneous rod of conducting material of length 100cm has its ends kept at zero temperate and temperature initially is

$f(x)=x; 0 \le x \le 50$

$=100-x; 50 \le x \le 100$

Find the temperature $u(x,t)$ at anytime.

PURBANCHAL UNIVERSITY
2019

Bachelor in Information Technology (B.I.T.)/Second Semester/*Final*

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT130EC: Electronic Devices & Circuits *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

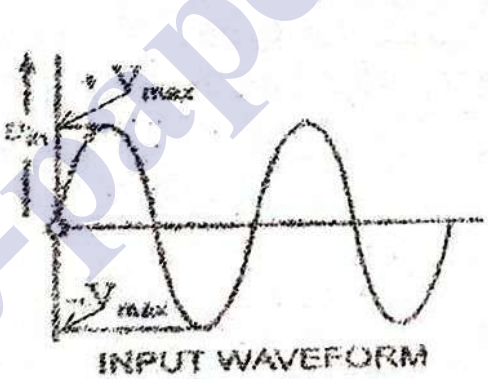
1(a) Explain construction of P-N junction diode and explain V-I characteristics. 3+3

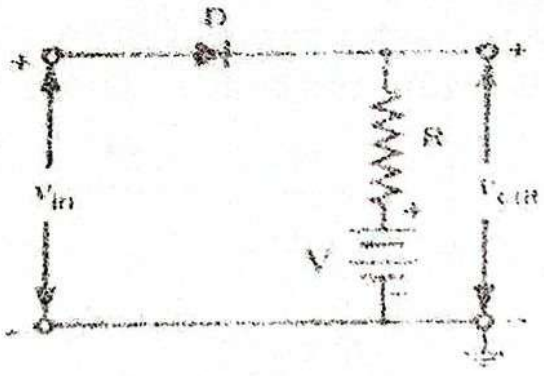
(b) Explain the working of a centre tapped type full wave rectifier with the help of circuit diagram and waveforms. 4+2

2(a) What do you understand by transistor biasing? Why is it necessary to bias a transistor? 3+3

(b) Describe construction, working and characteristics of N-channel JFET. 2+2+2

3(a) Draw the output waveform for the clipping circuit given below. The input is pure sinusoidal waveform as shown in the figure. 3





(b) Explain Ideal and practical characteristics of an OP-AMP. 5

(c) What are the major differences between a BJT and FET. 4

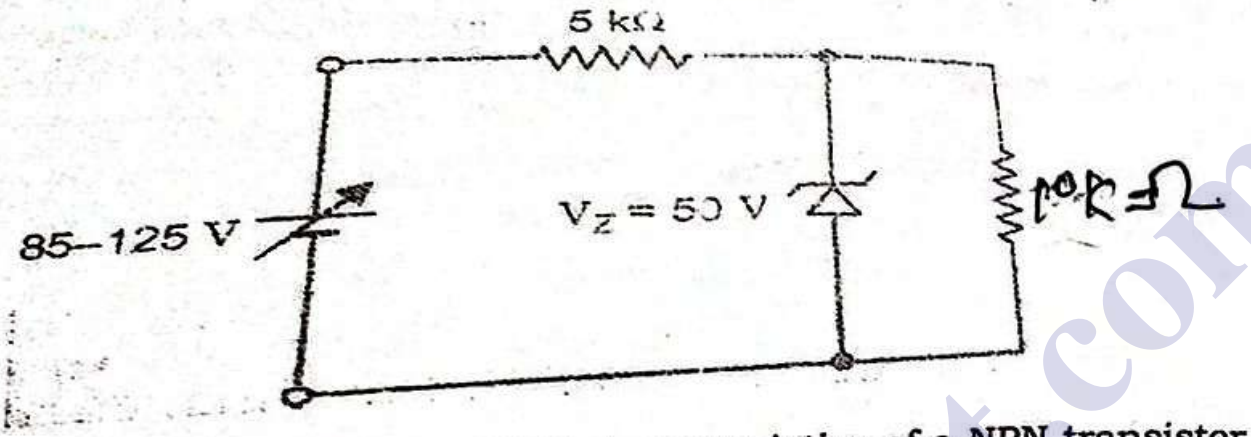
Group B

Answer EIGHT questions. **7×8=56**

4. Discuss about tunnel diode and explain tunneling phenomenon. 7

Contd. ...

5. For the zener regulator shown below, find the maximum and minimum current flowing through the zener diode. 4+3



6. Explain input and output V-I characteristics of a NPN transistor in CE configuration with neat sketches. 3+4

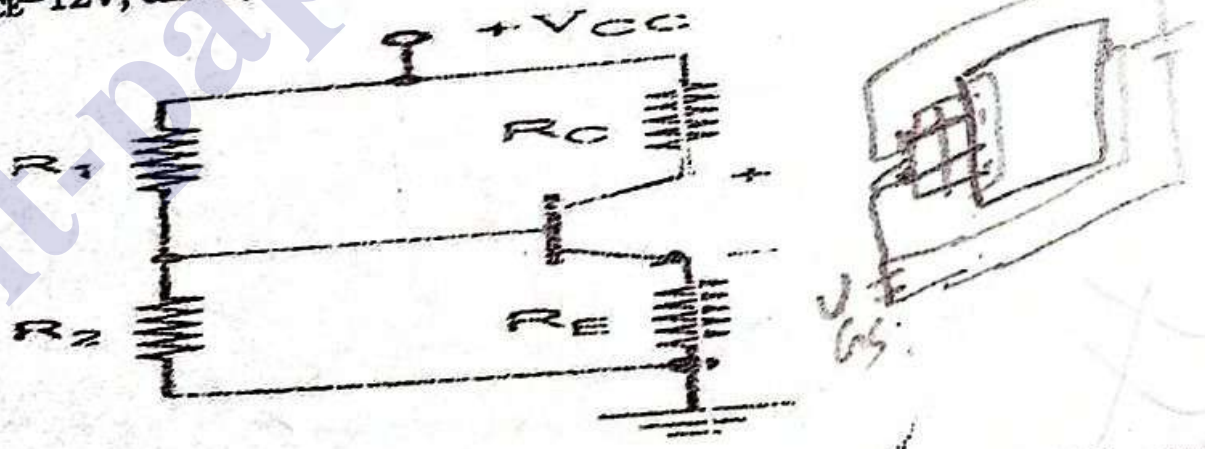
7. Draw the hybrid model of a BJT and define (i) hi (ii) hr (iii) h_f and (iv) h_o. 3+4

8. A BJT has the following parameters;

$h_{ie} = 2k\Omega, h_{re} = 16\times10^{-5}\ h_{fe} = 49\ and\ h_{oe} = 50\mu A/V$

Determine the current gain, voltage gain, input resistance and output resistance of the CE amplifier, if the load resistance is 30KΩ. Neglect source resistance. 1+1+2+3

9. A silicon transistor with β=100 is to be used in self-biasing circuit as shown below in such a way that the Q-point corresponds to V_{CE}=12V, and I_c=2mA. Find R_E if V_{cc}=12V, and R_c=5KΩ. 7



10. Draw schematic diagram of a depletion type MOSFET and explain its mechanism of operation. Sketch the drain current-drain voltage characteristics of the device and explain the meaning of threshold voltage. 2+2+3

11. Explain about Wein-bridge oscillator. 7

12. Calculate the output voltage of an op-amp summing amplifier for following sets of voltage and resistors. Use R_f=1MΩ in all cases,

(a) V_1= IV, V_2=+2V, V_3=+3 V, R_1=500KΩ, R_2=1 MΩ, R_3=1MΩ. 4

(b) V_1=-2V, V_2=+3V, V_3=+1, V, R_1=200KΩ, R_2= 500KΩ, R_3 = 1MΩ. 3

13. Write short note on: 3.5×2=7

(a) Application of OPAMP.

(b) Advantages of Negative Feedback.

PURBANCHAL UNIVERSITY
2019

Bachelor in Information Technology (B.I.T.)/Second Semester/*Final*

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT173CO: Digital Logic *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1. What is magnitude comparator? Design logic circuits for 4 bit magnitude comparator and explain it
2. What is JK master slave flip-flop? Design its logic circuit, truth table and explain the working principle.
3. Differentiate between ROM and PLA with necessary logic diagram.

Group B

Answer SEVEN questions. **7×8=56**

4. Design a half subtractor logic circuit using only NOR gate.
5. Describe the three variables K-map with example.
6. What is combinational logic? What are its important features?
7. What is logic gate? Explain the basic logic gates.
8. State and prove DE Morgan's theorem 1 and 2 with logic; gates and truth table.
9. Explain about SISO shift registers with logic diagram.
10. Differentiate between synchronous and asynchronous counter.
11. Convert the following decimal number into binary, hexadecimal and octal number.

    (a) 1987 (b) 2074

PURBANCHAL UNIVERSITY
2019

Bachelor in Information Technology (B.I.T.)/Second Semester/*Final*

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT191MS: Financial Management & Accounting *(New Course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1. What is the importance of financial management? Why is wealth maximization goal considered to be superior than profit maximization goal?

2. The following ledger balances of a company given as on 31.12.2002.

Debit	Rs	Credit	Rs
Plant and Machinery	125000	Purchase return	4500
Drawing	40000	Creditors	40000
Land & Building	80000	Provision for doubtful debts	5000
Salaries	32450	Rent received	8000
Cash in hand	21250	Sales	275000
Motor vehicles	53300	Bank overdraft	15500
Investment	48000	Capital	400000
Goodwill	38000	Commission	4000
Sundry debtors	60400	Bills payable	36000
Advertising	20500		
Purchases	140000		
Legal charges	12500		
Carriage in ward	9600		
Wages	23000		
Rent	30000		
Stock on 1. 1.2002	42000		
Sales commission	12000		
Total	788000		788000

You are required to prepare trading account, profit and loss account and balance sheet after taking into following adjustments:

- Closing stock was valued at Rs 20000
- Depreciate plant and machinery & motor vehicles by 10% per year and appreciate land and building by 5%.
- Create a provision for doubt ful debt @ 5%
- Salary paid in advance Rs 400
- Outstanding wages Rs 5000.

3. Kalika construction Pvt. Ltd is considering investing in project X and project Y in this year's capital budget. The projects are independent. The cash outlay for projects X is Rs 25000 and for project Y is Rs 23000 respectively. The firm's cost of capital is 12% and the net cash flows are as follows:

year	Projects X	Projects Y
	6500	6000
2	6500	6500
3	6500	5500
4	6500	5000
5	6500	6500

Which projects should be selected? Give your decision using NPV and IRR criteria.

Group B

Answer EIGHT questions. 8×7=56

4. Mr. Messy wishes to determine how much money he will have at the end of five years, if he deposits Rs 1000 annually in a saving account paying 8% annual interest. The deposits will be made at the end of each of the next five years and show the time line.

5. **From the following data calculate:**

- Gross profit ratio
- Current ratio
- Inventory turnover ratio
- Liquid ratio
- Assets turnover ratio
- Net profit ratio

Average inventory	400000
Costs of goods sold	96000
Current liabilities	300000
Fixed assets	720000
Liquid assets	360000
Long term debts	450000
Net profit	180000
Sales	1260000

6. From the following forecasts, prepare the cash budget for the months of April, May and June 2010.

Months	Credit sales Rs	Credit purchases Rs	Wages Rs	Office expenses Rs
February	60000	3500	5000	6000
March	60000	3500	8000	7500
April	70000	3300	10000	7000
May	68000	3500	7500	8500
June	56000	3800	6500	5600

- Cash balance on 1st April 2010 Rs 10000
- Advance tax of Rs 7000 is payable in May.
- Period of credit allowed to customers is one month and by suppliers one months.
- Lag in paymeat of office expenses and wages is one month.

7. Makalu Inc., expects annual sales of 600,000 units, purchased by the firm for Rs 10 per unit. The order cost is Rs 30 and Makalu's carrying cost as a percentage of the inventory value has been estimated @ 20%.

Required:

- What is the economic order quantity?
- How many orders Makalu should place each year?
- What is total cost of EOQ?

8. Enter the following items in two-column cashbook.

- 2010 Jan. 1st-Tarun commenced business with cash Rs 10,000; He pays Rs 2300 for goods bought; Rs 500 for furniture purchased; Rs 400 for office equipment.
- 02- He pays rent Rs 100; pays legal cost Rs 100
- 03- He sells goods for cash Rs 1800
- 04- He sells goods to Nitin on 5 days credit Rs 800
- 05-He pays wages Rs 15; cartage Rs 5
- 06-he buys goods for cash Rs 700 and pays a creditors Sunil Rs 425 in settlement of claim of Rs 430
- 07-He receives cash from Nitin allowing discount Rs 2
- 08-He sells goods for cash Rs 50
- 08-Cash deposited into bank Rs 500

9. What is the concept of time value of money? Explain.
10. What do you understand by dividend policy? Differentiate between stock dividend and cash dividend.
11. Explain the concept of optimal capital structure with suitable example.
12. Outline the rules of debit and credit for both equation rule and account type rule.
13. Discuss about the working capital. Why is it important to a firm?

PURBANCHAL UNIVERSITY
2019

Bachelor in Information Technology (B.I.T.)/Second Semester/*Final*

Time: 03:00 hrs. Full Marks: 80/Pass Marks: 32

BIT176CO: Object Oriented Programming in C++ *(New course)*

Candidates are required to give their answers in their own words as far as practicable.

Figure in the margin indicate full marks.

Group A

Answer TWO questions. **2×12=24**

1(a) How data hiding is accomplished? 3

(b) Differentiate between object oriented paradigm and procedural oriented paradigm. 4

(c) Discuss implicit and explicit type conversion with proper examples. 5

2(a) discuss static data member and static member function with proper illustrations. 3

(b) Write a program to illustrate copy constructor. 3

(c) Write a program to add two complex numbers of two different classes. 6

3(a) Give a suitable example for default argument. 5

(b) Create a class named Employee with four data members (ID, name, position, and salary). Using member functions initialize the data members for 3 objects and display information of all three of them. Assume appropriate data types. 7

Group B

Answer SEVEN questions. **7×8=56**

4. Write a program using function template that ask user to enter the 10 elements in the array of type int and float and display the five largest values in ascending order. 8

5. Write a program to overload binary '+' operator. 8

6. Define function prototype, How function overloading is achieved? Mention advantages of using an inline function. 2+3+3

7. Define pure virtual function and abstract class. Write a program to demonstrate ambiguity in multiple inheritance. 3+5

8. Create a class student that stores name and roll. From this class, derive a class marks that stores marks for 3 subjects. Then from the class marks derive a class record which stores semester and average marks for 3 subjects. Create an object for class record and display name, roll, marks in 3 subjects, semester, and average marks for a student. Assume appropriate data types. 8

9. Write a program to demonstrate writing an object to a data file and reading it back. 8

10. Mention features of this pointer. Write a program to demonstrate use of constructor in derived class. 2+6

11. Write short notes on any TWO: 2×4=8

(a) Namespaces

(b) Exception handling

(c) Basic functions of seekg( ), seekp( ), tellg( ), tellp( )