

PURBANCHAL UNIVERSITY**Time-bound Home Exam 2020**

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

Time: 03:00 hrs. (+2 Hrs. for Submission)

Full Marks: 80 /Pass Marks: 32

BIT120EL: Basic Electrical System and Circuits (New Course)**Instructions:**

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All questions carry equal marks. The marks allotted for each sub-question is specified along its side.

Group A**Answer TWO questions.****2×12=24**

- 1(a) State and explain ohm's law. 4
- (b) Find the equivalent resistance as seen from AB terminal: All resistances are in ohm. 8

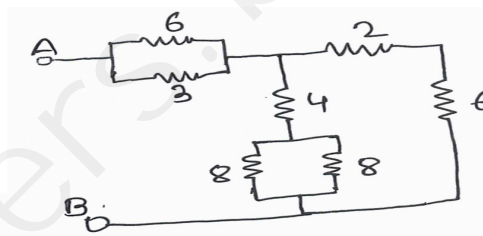


Figure 1b

- 2(a) State and prove Maximum Power Transfer Theorem. 7
- (b) Using superposition theorem, determine the current in 4 ohm resistance. 5

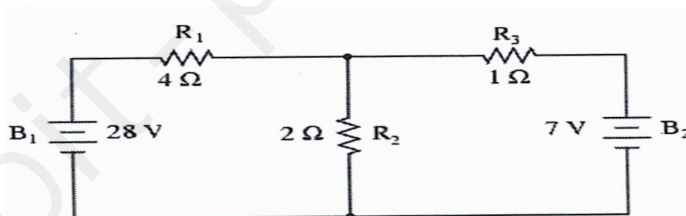


Figure 2b

- 3(a) Enumerate the differences between series and parallel magnetic circuits. 4
- (b) Prove that average power consumed by purely capacitive circuit is zero. 4
- (c) Define waveform, time period, cycle and frequency in reference to alternating current. 4

Group B**Answer SEVEN questions.****7×8=56**

4. State and explain Reciprocity Theorem with suitable example.

5. find the current through 10 ohm resistance using Thevenin's theorem.

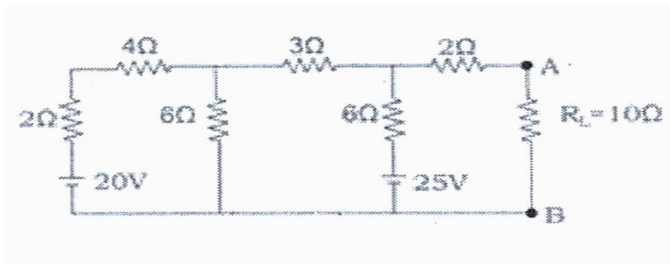


Figure 5

6.

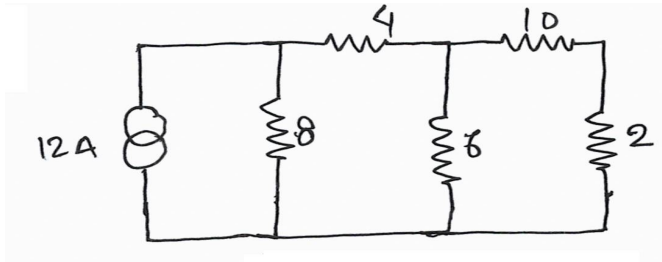


Figure 6

Using Norton's theorem, calculate the current in the 6Ω resistor in the network shown in fig. (6). All resistance are in ohm.

7. In a series RLC circuit, $R = 10 \text{ ohm}$, $L = 20\text{mH}$ and $C = 1\mu\text{F}$. The circuit is energized by a 220V single phase 50Hz supply. Determine impedance, current, active, reactive and apparent power. Also draw phasor diagram.
8. Define resonance in ac circuit. Also derive the expression for resonant frequency in parallel circuit consisting of coil (resistance and inductance) in one branch and capacitor in another branch.
9. A. 400 V three phase supply is used to energize the star connected balanced load of $6+j8 \text{ ohm}$. Determine phase current, Imp current, active power, reactive power and apparent power.
10. Use Thevenin's theorem to find current 10 ohm resistance.

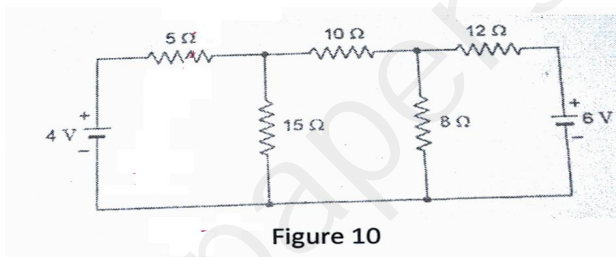


Figure 10

11. Two admittances of $6+j10 \text{ mho}$ and $6-j8 \text{ mho}$ are connected in parallel. If the total current is 15 A, determine the active power in each branch and active power of the circuit.
12. Write short notes on:
- Ohm's law for magnetic circuit
 - Temperature coefficient of resistance.



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

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BIT175CO: Computer Programming in C (New Course)**Instructions:***Dear Students!*

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Figure in the margin indicate full marks.

Group A**Answer TWO questions.****2×12=24**

- (a) Differentiate between pre-test loop and post-test loop. Write a program to find sum of first and last digit of a given number. 3+5
- (b) Write an algorithm and flowchart to print the natural numbers up to the number entered by the user. 2+2
2. Explain different file opening modes in C. Write a program to input 20 students information (student_name, student_roll, student_marks) and store them to a data file "student.dat", again finally, read the student-roll number from the user and display the associated student information of the entered roll number reading from the file "student.dat". 3+9
- 3(a) Mention advantages of using a user-defined function. Differentiate between local and global variables. 3+3
- (b) Write a program to read temperature of N days, where N is integer number entered by the user. Sort them in ascending order using pointer concept and display the result. 6

Group B**Answer SEVEN questions.****7×8=56**

4. Explain the various types of operators available in C. Explain bit-wise operator with suitable example. 4+4
5. Explain two formatted I/O functions, printf() and scanf() with syntax and example. Write a program two find the greatest of three numbers using ternary operator. 3+5
6. What are identifiers, keywords and escape sequence. Write a program to print the Health Risk based on the air quality index of the following table. 3+5

Health Risk	Air Quality Health Index
Low	1-3
Moderate	4-6
High	7-10
Very high	Above 10

7. What is dynamic memory allocation in C? Why it is useful? Describe memory management functions with suitable example. 1+1+6
8. Write a program to multiply two matrices A and B of order $m \times n$ and $p \times q$ respectively. 8
9. Define nested structure with a proper example. Write a program, using structure to input records of 100 students and display the record of student with the highest marks. The structure members include: student's name, roll, and percentage marks. 2+6
10. Explain break and continue construct. Write a program to find the sum of prime numbers between two numbers entered by the user. 2+6
11. Define pointer. Write a program using pointer to swap contents of two variables. 2+6
12. Write a program to display square of size 150 and four circles on each corner of square having radius 75. 8



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

Time: 03:00 hrs. (+2 Hrs. for Submission)

Full Marks: 60 /Pass Marks: 24

BIT170CO: Fundamentals of Information Technology (New Course)**Instructions:***Dear Students!*

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Figure in the margin indicate full marks.

Group A**Answer TWO questions.****2×12=24**

1. Classify computers on the basis of size and functionality. 8+4
2. Define internet and intranet. What is computer network? Explain the types of network. 5+7
- 3(a) What are storage devices? Explain any two primary storage devices. 6
- (b) Write down the features of 3rd and 4th generation computers. 6

Group B**Answer SIX questions.****6×6=36**

4. What are input and output device? Explain printer in details.
5. What is database management system? Write down its characteristics.
6. What do you mean by multimedia? What are the multimedia tools?
7. Why OS is known as master control program? Explain the application of computer in the field of engineering and technology.
8. What do you mean by information security? Write about some prevailing crimes in IT.
9. What is e-commerce? Explain OLAP.
10. Write short notes on any TWO: 3+3
 - (a) Virtual Reality
 - (b) Distributed system
 - (c) Electronic mail



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BIT101SH: Mathematics-I (New Course)**Instructions:**

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Group A**Answer ALL questions.****10×2=20**

1. Describe the locus of the equation $x^2 + 6xy + y^2 + z^2 = 1$ in spherical polar coordinates.
2. Find $\frac{dy}{dx}$ if $y = \log(1 + \sec x)$.
3. Evaluate: $\lim_{x \rightarrow \infty} x^n e^{-x}$.
4. If $\vec{a} = \vec{i} - 2\vec{j} + \vec{k}$, $\vec{b} = \vec{i} + 2\vec{j} - 4\vec{k}$ and $\vec{c} = 2\vec{i} - 3\vec{j}$, Evaluate : $\vec{a} \times \vec{b} \cdot \vec{c}$
5. Find the inverse of matrix $A = \begin{bmatrix} 7 & -4 \\ 5 & 8 \end{bmatrix}$.
6. Find $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$ if $f(x, y) = \tan^{-1}(xy^2)$.
7. Show that the curve $y = be^{-\frac{a}{x}}$, b the sub-tangent varies as the square of the abscissa.
8. Evaluate the integral: $\int_0^3 \int_1^2 xy(x+y) dx dy$.
9. Find the focus and directrix of the parabola $x^2 + 4y - 6x + 10 = 0$.
10. Find the area bounded by $y^2 = 2x$ and $y = x - 4$.

Group B**Answer EIGHT questions.****8×5=40**

11. If $px + qy = 1$ touches the curve $(ax)^n + (by)^n = 1$, show that $\left(\frac{p}{a}\right)^{\frac{n}{n-1}} + \left(\frac{q}{b}\right)^{\frac{n}{n-1}} = 1$.

12. Evaluate : $\lim_{x \rightarrow 0} \frac{e^x - e^{\sin x}}{x - \sin x}$.

13. Find the centre, eccentricity, foci and equation of directrices of the conic $9x^2 - 16y^2 + 72x - 32y - 16 = 0$

14. Find the asymptotes of the curve $y^3 + 2xy^2 + x^2y - y + 1 = 0$.
15. Find the radius of curvature at the point (r, θ) of the curve $r^2 = a^2 \cos 2\theta$.
16. Calculate the total perimeter of the asteroide $x^{\frac{2}{3}} + y^{\frac{2}{3}} = a^{\frac{2}{3}}$.
17. Prove by Maclaurin's series expansion of $\log(1 + \sin x) = x - \frac{x^2}{2} + \frac{x^3}{6} - \frac{x^4}{12} + \dots$
18. Find the area of the parabola $y^2 = 4ax$ bounded by its latus rectum.
19. find the volume of solid generated by line joining origin to (a, b) revolving about y-axis.

Group C**Answer FOUR questions.****4×5=20**

20. Find the value of c so that the lines $\frac{x-1}{-3} = \frac{y-1}{-2c} = \frac{z-1}{2}$ and $\frac{x-1}{3c} = \frac{y-5}{1} = \frac{z-6}{-5}$ are perpendicular to each other.
21. Prove by using the properties of determinants
- $$\begin{vmatrix} a+b+2c & a & b \\ c & b+c+2a & b \\ c & a & c+a+2b \end{vmatrix} = 2(a+b+c)^3$$
22. If $u = \tan^{-1} \left(\frac{x^3+y^3}{x-y} \right)$, prove that $x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = \sin 2u$.
23. Solve the system of linear equations by Gauss - Jordan method.
- $$\begin{aligned} 2x+y+z &= 10 \\ 3x+2y+3z &= 18 \\ x+4y+9z &= 16. \end{aligned}$$
24. Change to polar coordinates and then evaluate the double integral. $\int_0^2 \int_0^{\sqrt{2x-x^2}} \frac{x}{x^2+y^2} dy dx$.

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BIT190MS: Principles of Management (New Course)**Instructions:***Dear Students!*

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*Figure in the margin indicate full marks.***Group A****Answer TWO questions.****2×12=24**

1. "Management is the art of getting things done through people" Explain.
2. What do you mean by decision making? Explain rational decision making process.
3. What are the various forms of organizational structure? Explain.

Group B**Attempt SEVEN questions****7×8=56**

4. What are the steps of planning process?
5. "In matrix organization, the personnel working on the project having a responsibility to their functional manager and project manager". Justify the statement.
6. Explain principles of organization.
7. Enlist the important aspects that are assessed by managers through SWOT analysis.
8. Differentiate between autocratic and democratic leadership style?
9. What are the methods of training? Explain.
10. Explain communication with its process.
11. Define reporting with its types.
12. "Co-ordination is an integral element or ingredient of all the managerial function." Explain.

13. Write short notes on any TWO:**4+4**

- (a) Need of Hierarchy Theory (b) Kaizen (continuous improvement)
 (c) Quality circle (d) Job analysis



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BIT105SH: Technical Communication (English) (New Course)**Instructions:***Dear Students!*

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*Figures in the margin indicate full marks.***Answer ALL questions.**

1. Read the following passage and answer the questions asked below. 15

A lot of people are involved with nature conservation, taking care of the plants and animals which share the planet. Until the beginning of the 20th century, people thought we could conserve nature by looking after individual species by putting wild animals in zoos, or plants in botanical gardens. Now we understand that we need to conserve whole habitats, the places where these plants and animals live.

Polar bears may be able to survive as individual animals in concrete pools in Zoos. But to conserve the species properly they each need hundreds of square kilometers of Arctic landscape where they can hunt in seas free from pollution and roam across snowfields that are not disturbed by people. Nearer home, hedgehogs need a whole neighborhood to live in, with quiet leafy corners for hibernation, and plenty of undergrowth where they can hunt for slugs and worms, without any danger of eating poisonous chemicals.

We can grow primroses in plant pots, but to conserve these wildflowers properly, we need to conserve the woodlands where they grow naturally. Nature reserves are important for providing a safe environment for wildlife, but nature conservation can take place anywhere.

Lots of people are creating new habitats such as ponds and wildflower meadows, in gardens and school grounds. In fact some species thrive best in special artificial habitats. Many starlings, for instance, spend the cold winter nights roosting on the windowsills of centrally heated office blocks in towns, and then feed all day on the grubs and worms that live in the soil beneath school playing fields, sports pitches and parks. Most of the wildflowers we call weeds can survive only if a farmer or a gardener cultivates the soil and accidentally makes a new seed bed for them each year.

Questions:

- (a) What do you mean by 'nature conservation'?
- (b) A zoo or a botanical garden is not a suitable place for many species to survive. Which are these species?
- (c) Name some species that survive most successfully in artificial habitats. How do they survive?

- (d) Why do nature reserves are important?
- (e) Give a suitable title to the passage.
2. Answer any two of the following: 2×8=16
- (a) Prepare a complete manuscript for a talk on "Importance of Information Technology in Nepal" lasting for 10 minutes.
- (b) Imagine that you are a secretary of Subani Manufacturing Company Pvt. Ltd., Baluwatar, Kathmandu. Prepare the discussions of the different members along with the suggestions of the chairman about the causes of frequent strikes in the company's factory at Ring Road.
- (c) Prepare a notice along with agenda for the 10th meeting of the board of directors of Agni Cement Industries, Balkhu, Kathmandu.
3. Define group discussions. Describe the importance of group discussions in reaching the meeting to conclusion. 8
4. Write a letter to the managing director of World Link Communications Pvt. Ltd. located at New Road, Kathmandu, applying for the post of a System Administrator. Also include your complete C.V. 8
5. Write short notes on any TWO: 2×4=8
- (a) Fundamentals of effective writing
- (b) Notice Preparation
- (c) Extensive Reading
6. Write an essay on any ONE: 8
- (a) Impact of Globalization
- (b) Importance of Technical Education
7. Mark stress on the correct syllable of the following words: 4
- Thousand, Biology, Present, Beneath, China, Severe, Tuberculosis, Religious.
8. Put suitable intonation mark in the following: 4
- (a) She is ten years old.
- (b) Where do you live?
- (c) Open the door.
- (d) Would you like an apple or a pear?
9. Fill in the blanks with appropriate clauses: 4
- (a) If I know her name,_____.
- (b) If he were to disturb her,_____.
- (c) When I reached the airport,_____.
- (d) Had she married him,_____.
10. Fill in the blanks with appropriate prepositions: 2
- (a) The stories are full_____ interest.
- (b) He drove the car_____ full speed.
- (c) Sita is sitting_____ kamala and Bimala.
- (d) He is fond_____ playing football.
11. Fill in the blanks with correct format verb. 3
- (a) The king before the team of doctor arrived.
- (died, had died)
- (b) If they I would give them a tip. (come, came)
- (c) I dare not it. (do, to do)

