Department of Information and Communication Engineering

Pabna University of Science and Technology

Faculty of Engineering and Technology

B.Sc. (Engineering) 1st Year 2nd Semester Examination-2020

Session: **2019-20, 2018-19, 2017-18, and 2016-17**

Course Code: **ICE-1201** Course Title: **Analog Electronics**

NB: 1. Answer any **SIX** (THREE out of four from each PART) questions.
2. Figures in the right margin indicate full marks.
3. Parts of the same question should be answered together and in the same sequence.

Time: 3 Hours **Total Marks: 70**

PART-A

1. a) What is Amplifier? Classify Amplifier. 03
   b) Draw a CE Amplifier configuration and explain its circuit operations. Write down the various gains of a CE Amplifier. 6.67
   c) What are the uses of Common Collector amplifier? 02

2. a) What do you understand by single stage transistor amplifier and Phase reversal? 03
   b) Define voltage gain stability. Describe the process to achieve stability of an amplifier. 4
   c) What is ac Emitter Resistance? Calculate voltage gain of CE Amplifier. 4.67

3. a) Describe the operational details and Frequency response of RC Coupled Transistor Amplifier with necessary figure. 05
   b) A transformer coupling is used in the final stage of a multistage amplifier. If the output impedance of transistor is 1kΩ and the speaker has a resistance of 10Ω, find the turn ratio of the transformer so that maximum power is transferred to the load. 2.67
   c) Why gain is expressed in "Decibel"? Write down the differences between Transistor and Tube Amplifiers. 04

4. a) What is the general equation for the voltage gain of an amplifier with feedback? Why is the voltage gain of an amplifier with negative feedback smaller than with no feedback? 05
   b) List as many advantages of negative feedback as you can think of, indicating any possible restrictions or disadvantages associated with each. 3.67
   c) An amplifier has -20 dB of feedback introduced. 03
      i) What is the ratio of voltage gain before feedback to the gain with feedback?
      ii) Determine the loop gain.

PART-B

5. a) What is a multivibrator? What are the differences among three types of multivibrator? 03
   b) Briefly explain the operation of a Colpitt's oscillator with suitable diagram. 5.67
   c) The ac equivalent circuit of a crystal has L=1H, C=0.01pF, R=1000Ω and Cm=20pF. Calculate fs and fp of the crystal. 03

6. a) Classify the microelectronics. 02
   b) Briefly discuss the steps in fabricating the simple monolithic integrated circuit. 05
   c) Why no satisfactory method of fabricating inductor in integrated circuit? 4.67

7. a) Define the terms i) CMRR and ii) Slew rate. 02
   b) Explain the operation Inverting and Non-Inverting amplifier using IC-741. 06
   c) Discuss the operation of Astable multivibrator using IC-555 timer. 3.67

8. a) What is an Op-amp? Write down some basic properties of 741 Op-Amp. 2.67
   b) Explain operation of active i) Band pass and ii) Band stop filters with circuit diagram. 06
   c) A band pass filter has lower cutoff and upper cutoff frequencies of 20 KHz and 22.5 KHz respectively. What are the bandwidth, center frequency and Q? 03

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Faculty of Engineering and Technology

B.Sc. (Engineering) 1st Year 2nd Semester Examination-2020

Session: **2019-2020, 2018-19, 2017-18, and 2016-17**

Course Code: **ICE-1203** Course Title: **Programming with C**

NB: 1. Answer any **SIX** (Three form each **PART**) questions.
2. Figures in the right margin indicate marks.
3. Parts of the same question should be answered together and in the same sequence.

Time: 3 Hours **Total Marks: 70**

PART-A

1. a) What do you mean by computer program? What are the advantages of high level language? 3
   b) What are the characteristics of C? Is it a special purpose language? Explain. 3
   c) Consider a problem where you are given two positive integers. Your task is to add a value 10 with the smallest number and subtract 5 from the largest number. Find their sum and check whether the sum is greater than the large number. 5.67
      i) Write the algorithm steps.
      ii) Draw the flowchart.

2. a) What is data type of C programming language? 2
   b) What is symbolic constant? Write a C program with symbolic constant. 4
   c) Briefly describe the different data types in C programming language. 5.67

3. a) What do you mean by formatted input and formatted output in C programming language? 3
   b) Identify syntax errors in the following C program: 2

```
main()
{
Int a, b, d
Printf(Enter the value of a b)
Scanf(%d %f, &s,&b)
D=a+b
Ptintf(%g,d)
Return (0);
}
```

   c) Write a C program to sort an array of integer into ascending order. 4.67
   d) Differentiate between goto and break statements. 2

4. a) What do you mean by array? 2
   b) Explain two dimensional array in C programming language with suitable example. 5.67
   c) Write down the general format of nested for loop with flowchart and a suitable example. 4

PART-B

5. a) Define parameter and argument. 3

b) Distinguish between call by value and call by references of a function. 6

c) What are the outputs of the following program: 2.67

```
#include<stdio.h>
void f1(int a)
{
static int b=10;
   b=a+b;
printf("b=%d",b);
}
void main()
{
   f1(20);
   f1(20);
   f1(20);
}
```

6. a) What do you mean by prototyping? 2

b) Explain run time and compile time errors in C programming language. 3.67

c) What are the differences between user defined and library function? 3

d) State some rules for initializing structure in C programming language. 3

7. a) Define pointer, union and structure. 3

b) Explain automatic and static variables. 3

c) Write a C program to print string using pointer. 3

d) Why do you need a terminating null character? 2.67

8. a) What do you mean by fprintf() and fscanf() function? 3

b) Write down the operation of getw(), putw(), fseek() putc() and rewind() functions. 5

c) Briefly discuss about the error handling within input/output operation in C program. 3.67

Department of Information and Communication Engineering

Pabna University of Science and Technology

Faculty of Engineering and Technology

B.Sc. (Engineering) 1st Year 2nd Semester Examination-2020

Session: **2019-2020, 2018-19, 2017-18, and 2016-17**

Course Code: **ICE-1205** Course Title: **Circuit Theory and Analysis**

NB: 1. Answer any **SIX** (THREE from each PART) questions.
2. Figures in the right margin indicate marks.
3. Parts of the same question should be answered together and in the same sequence.

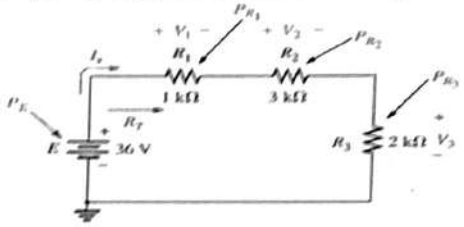
Time: 3 Hours **Total Marks: 70**

PART-A

1. a) Define the following terms: Circuit, Power, Energy and Efficiency. 3

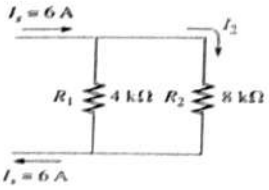
   b) A 2 hp motor operates at an efficiency of 75%. What is the power input in watts? If the applied voltage is 220 V, what is the input current? 2.67

   c) For the series circuit of the following figure (all standard values): 6
   a. Calculate the current I_s.
   b. Determine the voltage across each resistor.
   c. Determine the power dissipated by each resistor.
   d. Comment on whether the total power supplied equals the total power dissipated.

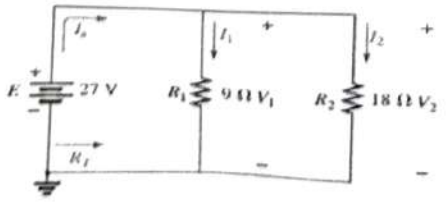


2. a) Explain current divider rule with suitable diagram. 2.67

   b) Determine current I_2 for the network of following figure using the current divider rule. 3

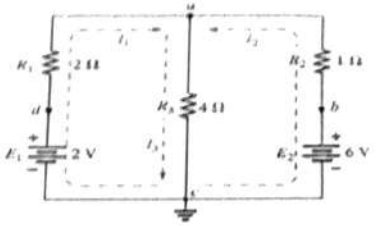


   c) For the parallel network of following figure: 6
   a. Find the total resistance.
   b. Calculate the source current.
   c. Determine the current through each parallel branch.
   d. Show that $I_s = I_1 + I_2$ is satisfied.

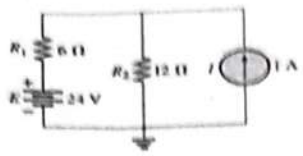


3. a) Write down the steps of Branch-Current analysis procedure. 1.67

   b) Apply the Branch-Current analysis method to the following dc network. 5



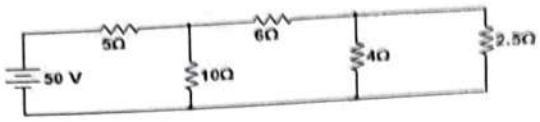
c) Apply nodal analysis to the following dc network. 5



4. a) What are the different network theorems? Explain Maximum Power Transfer Theorem and derive an expression for P_{max}. 6

b) What is Kirchoff's Current Law (KCL)? 2

c) Using Thevenin's theorem, find the current through 2.5Ω Resistance in the following circuit. 3.67



PART-B

5. a) What are the functions of rectifier? Derive the expression for the following parameters of the full wave rectifier circuit: i) Average dc current, ii) R. M.S value of current, iii) Ripple factor and iv) Rectifier efficiency. 6

b) Given $i = 6 \times 10^{-3} \sin 1000t$, determine i at $t = 2$ ms. 3

c) Given $e = 5 \sin \alpha$, determine e at $\alpha = 40^0$ and $\alpha = 0.8\pi$. 2.67

6. a) Deduce the expression for average power delivered to a load for sinusoidal voltage and current. 3

b) The voltage across a resistor is indicated. Find the sinusoidal expression for the current if the resistor is 10 Ω. Sketch the curves for v and i. 6

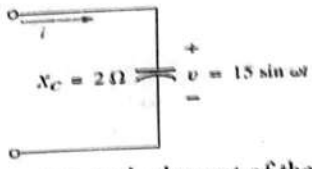
a. $v = 100 \sin 377t$

b. $v = 25 \sin (377t + 60^0)$

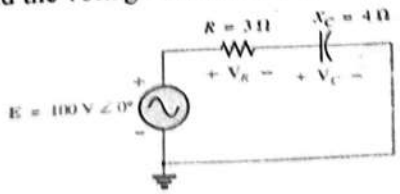
c) The voltage across a 0.5 H coil is $v = 100 \sin 20t$. What is the sinusoidal expression for the current? 2.67

7. a) Define Admittance and Susceptance. 1.67

b) Using complex algebra, find the current i for the circuit of the following figure. Sketch the v and i curves. 5



c) Using the voltage divider rule, find the voltage across each element of the following circuit. 5



8. a) What do you understand by resonant circuit? Show that the resonant frequency of series resonant circuit is $f_s = \frac{1}{2\pi\sqrt{LC}}$, where the symbols have their usual meaning. 5

b) Show that the quality factor of series resonant circuit is $Q_s = \frac{1}{R}\sqrt{\frac{L}{C}}$, where the symbols have their usual meaning. 4

c) The bandwidth of a series resonant circuit is 400 Hz. i) If the resonant frequency is 4000 Hz, what is the value of Q_s? and ii) If $R = 10\ \Omega$, what is the value of X_L at resonance? 2.67

Department of Information and Communication Engineering

Pabna University of Science and Technology

Faculty of Engineering and Technology

B.Sc. Engineering 1st Year 2nd Semester Examination-2020

Session: **2019-2020, 2018-19, 2017-18, 2016-17, and 2015-16**

Course Code: **Math-1201** Course Title: **Integral Calculus and Differential Equations**

NB: 1. Answer any **SIX (THREE from each PART)** questions.
2. Figures in the right margin indicate marks.
3. Parts of the same question should be answered together and in the same sequence.

Time: 3 Hours **Total Marks: 70**

PART-A

1. a) Evaluate any three of the following integrals 9

i) $\int \frac{e^x(1+x)}{\cos^2(xe^x)}dx$ ii) $\sqrt{(x-\alpha)(\beta-x)}\,dx$ iii) $\int \sin^{-1}\sqrt{\frac{x}{x+a}}\,dx$

iv) $\int \cos\left(2\cot^{-1}\sqrt{\frac{1-x}{1+x}}\right)dx$ v) $\int \frac{\cos x\,dx}{\sqrt{(5\sin^2 x-12\sin x+4)}}$

b) If $u = \int e^{ax}\cos bx\,dx$ and $v = \int e^{ax}\sin bx\,dx$ then prove that $(a^2+b^2)(u^2+v^2) = e^{2ax}$ 2.67

2. a) Evaluate $\lim_{n\to\infty}\left[\frac{1^2}{1^3+n^3}+\frac{2^2}{2^3+n^3}+\frac{3^2}{3^3+n^3}+\cdots.+\frac{n^2}{n^3+n^3}\right]$ 6

b) Show that $\int_0^{\frac{\pi}{2}}\sin^6\theta\cos^3\theta d\theta = \frac{2}{63}$ 5.67

3. a) Define Beta and Gamma function. Show that $\beta(m,n) = \frac{\Gamma(m)\Gamma(n)}{\Gamma(m+n)}$ 5

b) Prove that $\Gamma(n+1) = n\Gamma(n)$ and hence show that $\Gamma(n+1) = n!$ 3.67

c) Define improper integral. Evaluate $\int_{-\infty}^{\infty}\frac{dx}{1+x^2}$ 3

4. a) Obtain the reduction formula for $\int_0^{\frac{\pi}{2}}\sin^2 xdx$ 3.67

b) Find the area above the x-axis included between the parabola $y^2 = ax$ and $x^2+y^2 = 2ax$. 4

c) Find the area of the astroid $x^{\frac{2}{3}}+y^{\frac{2}{3}} = a^{\frac{2}{3}}$ 4

PART-B

5. a) Form the differential equation of which $c(y+c)^2 = x^3$ is the complete integral. 3

b) Solve the initial value problem $\left(y+\sqrt{x^2+y^2}\right)dx - xdy = 0, y(1) = 0.$ 4

c) Define an Integrating factor. Find the integrating factor and solve the equation $\frac{dy}{dx}+(\frac{2x+1}{x})y = e^{-2x}$. 4.67

6. a) Define oblique trajectories. Find a family of oblique trajectories that intersect the family of circles $x^2+y^2 = c^2$ at angle 45°. 6

b) Solve the differential equation $\frac{dy}{dx}-\frac{y}{x} = -\frac{y^2}{x}$. 5.67

7. a) Solve: $\frac{d^3y}{dx^3}-2\frac{dy}{dx}+4y = e^x\cos x$ 5.67

b) Use the method of variation of parameter to solve the equation $\frac{d^2y}{dx^2}+y = \cot x$. 6

8. a) Solve the Cauchy-Euler equation $x^3\frac{d^3y}{dx^3}+4x^2\frac{d^2y}{dx^2}+8x\frac{dy}{dx}-8y = 4\ln x$. 5.67

b) Explain the followings with example 6
i) ordinary point, ii) singular point and iii) regular and irregular singular point.

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Department of Information and Communication Enginnering

Pabna University of Science and Technology
Faculty of Engineering and Technology
B.Sc. (Enginnering) 1st Year 2nd Semester Final Examination 2020
Session: **2019-2020**

Course Code: **BBA-1201** Course Title: **Industrial Management and Accountancy**

NB: 1. Answer any **SIX** (THREE from each PART) questions.
2. Figures in the right margin indicate marks.
3. Parts of the same question should be answered together and in the same sequence.

PART-A

1.	a)	Define management and managers.	4
	b)	Identify and briefly explain the four basic management functions in organizations.	7.67
2.	a)	Identify the basic managerial roles played by managers.	5
	b)	Describe the kinds of managers found at different levels and in different areas of the organization.	6.67
3.	a)	What is plant layout? Discuss the different types of plant layout.	6
	b)	What factors would you consider in plant layout planning?	5.67
4.	a)	What are the strategies for retaining competent and high-performing employees.	5
	b)	Discuss the tasks associated with identifying and selecting competent employees.	6.67

PART-B

5.	a)	What is extended accounting equation?	4
	b)	Describe the role of accounting in creating sense of value and accountability.	7.67
6.	a)	Define cost. What are the elements of cost?	4
	b)	State the classification of cost.	3
	c)	Discuss the use of relevant costs in decision making.	4.67
7.	a)	"Every transaction is an event; every event is not a transaction"- Explain.	3
	b)	Which events are transactions and which are not is explained by the following examples- In the business of Mr. Alam, the following events took place- 1. Mr. Alam started business with tk. 2,50,000. 2. He purchased goods with cash tk. 40,000. 3. He has paid one of his creditors tk. 45,000. 4. He has placed an order for purchasing goods worth tk. 80,000. 5. Made an expense for advertisement worth tk. 20,000. 6. Mr. Rafiq has appointed as manager in business for a monthly salary tk. 40,000. 7. Withdrawn from business for his personal use tk. 30,000. 8. Tk. 5000 has stolen from his personal fund. 9. Agreed to purchase goods from Hashem Brother's worth tk. 50,000 per month. 10. Sold goods to Hanif on account tk. 45,000.	8.67
8.	a)	What is controlling and why is it important?	4
	b)	Describe the managerial decisions in the control process.	7.67

Department of Information and Communication Engineering

Pabna University of Science and Technology

Faculty of Engineering and Technology

B.Sc. (Engineering) 1st Year 2nd Semester Examination-2020

Session: **2019-2020, and 2017-18**

Course Code: **Eng-1201** Course Title: **Fundamental English**

NB: 1. Answer any **SIX (**THREE from each PART**)** questions.
2. Figures in the right margin indicate marks.
3. Parts of the same question should be answered together and in the same sequence.

Time: 3 Hours **Total Marks: 70**

PART-A

1. a) **Change the following words as directed (if necessary) and make sentences with the new words:** 4

i) if (adjective) , ii) Above (Noun), iii) retirement (Verb), iv) water (Verb)

b) **Join the following phrases and idioms:** 2.67

i)	Hot cake	holding a grudge
ii)	A Chip on Your Shoulder	Win
iii)	An Arm and a Leg	Get two things done with a single action
iv)	Burst Your Bubble	to be disposed of very quickly
v)	Kill two birds with one stone	Something that is very expensive
		To ruin someone's happy moment or mood
		Hot

c) **Frame Wh-questions from the following sentences.** 5

i) Rahim opened the door. ii) I will go to school at 3 PM. iii) This movie is bizarre. iv) I saw him swimming. v) Joy drives Rahi's car.

2. a) **Rewrite the following sentences using the right form of verbs: (any six)** 6

i) His father (die) last year.
ii) We should have (study) well.
iii) They (reach) by this time.
iv) The color of his eyes (be) blue.
v) The criminal and offender (be) present.
vi) Scarcely he (see) the police when he ran away.
vii) Neither Rupa nor her sister..... (be) present in the last meeting.

b) **Fill in the gaps with appropriate prepositions : (any six)** 5.67

i) The man died ..... starvation. ii) Liberty does not descend..... a nation.
iii) Don't run ..... fame. iv) The chair is made ..... wood.
v) The cat jumped .....the wall. vi) He persisted .....doing this.

3. a) **Transform the following sentences as directed: (any six)** 6

i) We listen to understand. (Complex)
ii) Diamond is the most precious gems. (Simple)
iii) The sunbeam is wonderful to look at. (Exclamation)
iv) The tea being very hot, I could not drink it. (Compound)
v) Macbeth is the most popular drama. (Comparative)
vi) Alas! He died of cancer. (Assertive)
vii) No other city in France is as charming as Paris. (Superlative)
viii) I shall always remember you. (Negative)

b) **Change the following statements as directed:** 5.67

i) The news shocked him. (Passive)
ii) Do it as I instruct. (Passive)
iii) A job was offered to him by Simu. (Active)
iv) Who is hated by you? (Passive)
v) Is the man recognized by you? (Active)
vi) Let this line be penned through. (Active)

4. a) **Report the following sentences in indirect speech:** 6

i) "Wonderful!" he exclaimed. (Indirect)
ii) He said, "I have had my dinner." (Indirect)
iii) He asked me, "What are you doing?" (Indirect)
iv) Father said, "May you be happy"! (Indirect)
v) The officer said, "Please fill up the form."(Indirect)
vi) "Have a good journey" he said. (Indirect)

b) **Make your own sentences with the following :** 5.67

i) A dark horse, ii) To and fro, iii) Crocodiles tears, iv) Take pity on, v) Red-handed.
vi) Null and void

PART-B

5. **Read the passage carefully & answer the questions that are given below:**

Teaching English to the native people of Bangladesh is not at all an easy task. In school the traditional grammar-translation method is followed so the pupils only develop their reading and writing skills but they can't speak or understand English by listening. So a direct method, which gives stress to listening and speaking, has been developed .The teacher has to draw pictures, act to create a situation and0 has to show models or real object. It is creating a bond between experience and expressions. It is time consuming because the teacher has to create a situation of English speaking environment, which is a tiresome task. Also it is mechanical and monotonous. So, communication approach has to evolved, where interaction between the teacher and the students takes place as a two-way process. Audio-lingual approach also has evolved as modern concept where there is a scope to follow the English speaker to improve listening and speaking skills as well as pronunciation through the cassettes.

a) **Answer the questions below:** 4

i) Why is teaching English to native people of Bangladesh not an easy task?
ii) What are the methods mentioned in the passage?

b) **Change the following words as directed and make sentences with them:** 4

i) Structure (adjective), ii) pronunciation (verb), iii) communicative (noun), iv) essential (adverb).

c) **Make a précis of the passage above.** 3.67

6. a) **What do you mean by skimming and scanning? Describe.** 4.67

b) **Write a paragraph on any one of the following:** 7

i) Beautification of your University
ii) Cyber Crime

7. Suppose Pabna University of Science and Technology, Bangladesh is seeking application for the post of Lecturer in the Department of ICE. Now write a **Cover letter** to register, PUST Bangladesh and attach a **CV** to it. 11.67

8. **Amplify the idea contained in any two of the followings:** 11.67

i) United we stand, divided we fall.
ii) As you sow, so you reap.
iii) A stitch in time saves nine.

Pabna University of Science and Technology
Department of Information and Communication Engineering
BSc (Honors) 1st Year 2nd Semester English Sessional Examination-2020
Course Code: ENG-1202
Course Title: Fundamental English Sessional

Listening Part

Time : 1.20 hours **Marks : 20**

1. **Complete the notes below: Write no more than three words for each answer.** **10**

Number of peopleapproximately-.....
Date of party .....
Name of room ..... .
Time from.....to .....pm.
Postcode .....
Flat ....., 35 Beeches Street.
Telephone, Landline .....
Cost of room hire $ 115 with .....
Disco system hire, optional. Fee $25 with no technician.
Deposit $ .....
Covers cancellation .....

2. **Complete the notes below: Write one word only for each answer.** **5**

Grass roof: cooler in summer, warmer in winter. Little ..... encourages biodiversity absorbs water run-off. ..... appearance in winter . Tiles: ..... appearance, ... absorption. Thatched roof: good insulator, very ..... not ideal for cities.

3. Which **two** methodsfor encouragingpeople to install grass roofs are mentioned? **2**

a. educating school children
b. holding design competitions
c. support from celebrities
d. making grass roofs cheaper
e. using the media

4. What are the sub skills of listening? Elucidate. **3**

Pabna University of Science and Technology
Department of Information and Communication Engineering
BSc (Honors) 1st Year 2nd Semester English Sessional Examination-2020
Course Code: ENG-1202
Course Title: Fundamental English Sessional

Writing Part

Time : 01 hour **Marks : 20**

1. What are the good qualities of a presentation? Distinguish between argumentative presentation and persuasive presentation. 6

2. A son is talking with his father on the point of choosing a career. He needs some suggestionsto make himself eligible for having the desiring job. Now construct a dialogue between son andfather about asking for and giving advice. 8

3. Write short notes on any two: 6

   a. IPA

   b. Phonetics

   c. Paralinguistic features

   d. Self-introduction