

JAMMU & KASHMIR BOARD OF TECHNICAL EDUCATION

MJ-22

Subject: Applied Mathematics-II
Scheme: New

Semester: 2nd
M. Marks: 100

Roll No. 16-07 R 21-16 817
Branch: All
Time: 03 Hours

Instructions:

1. Attempt any Five Questions.
2. Figures to the right indicate marks.

- Q1.** (a) Evaluate the limit $\lim_{x \rightarrow 0} \frac{1-\sqrt{1+x}}{x}$ 10
- (b) Evaluate $\int \tan^{-1} x \, dx$ 10
- Q2.** (a) Differentiate from the first principle the function $\sin x$ w.r.t x . 10
- (b) If $y = \sqrt{\sin x + \sqrt{\sin x + \sqrt{\sin x + \dots}}} \dots \infty$
Prove that $\frac{dy}{dx}(2y - 1) = \cos x$ 10
- Q3.** (a) Differentiate the function $\sin^{-1}(2x\sqrt{1-x^2})$ 10
- (b) Find the point at which the curve $y = 10 + 2x - x^2$ has its slope equal to unity 10
- Q4.** (a) If $y = \tan^{-1} x$ prove that $(1+x^2)\frac{d^2y}{dx^2} + 2x\frac{dy}{dx} = 0$ 10
- (b) Evaluate $\int \sqrt{x}(ax^2 + bx + c) \, dx$ 10
- Q5.** (a) Evaluate $\int \sin 4x \cos 3x \, dx$ 10
- (b) Evaluate the limit $\lim_{x \rightarrow 0} \frac{1-\cos x}{\sin^2 x}$ 10
- Q6.** (a) Solve the differential equation $\frac{dy}{dx} + \frac{2}{x} y = 0$ 10
- (b) Integrate $\int_0^{\frac{\pi}{2}} \sin^2 x \, dx$. 10
- Q7.** (a) Find the mean from the given data.
- | Class interval | 0-7 | 7-14 | 14-21 | 21-28 | 28-35 | 35-42 | 42-49 |
|----------------|-----|------|-------|-------|-------|-------|-------|
| frequency | 19 | 25 | 36 | 72 | 51 | 43 | 28 |

(b) Find out the standard deviation for the following data 5,8,7,11,9,10,8,2,6,7.

10

Q8. (a) Solve the differential equation $\frac{dy}{dx} - \frac{y}{x} = \tan \frac{y}{x}$.

10

(b) The arithmetic mean of 7, 9, 5, 2, 4, 8, x is given to be 7. Find x.

10

Q9. (a) Differentiate $\ln \sin^{-1} x$.

10

(b) Evaluate $\int x e^{2x} dx$

10

Q10. (a) Find the maximum slope of the curve $y = -2x^3 + 6x^2 + 8x - 1$

10

(b) Differentiate $\sin^{-1}(2x\sqrt{1-x^2})$

10

$$\frac{dy}{dx} = \dots$$

$$\frac{dy}{dx} = \dots$$

$$\frac{1 - \sin \theta}{\theta} = 1$$

$$\begin{array}{r} 127 \\ 384 \\ \hline 5115 \end{array}$$

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MJ-22

Roll No.....

Subject: Basic Electrical Engg.

Semester: 2nd

Branch: Eletx. & Comm. Engg. / Med. Eltx. /Computer Engg. /IT

Scheme: New

M. Marks: 100

Time: 03 Hours

Note: Attempt any five questions.

- Q.1. (a) Derive an expression for total resistance when resistances are connected in series. (10)
(b) Explain Kirchhoff's current law and voltage law. (10)
- Q.2. State and Explain Thevenin's Theorem. (20)
- Q.3. (a) What do you mean by constant voltage source. Explain Ideal Voltage source. (20)
- Q.4. (a) Define Magnetic Circuit. Also give the comparison between magnetic circuit and electric circuit (20)
- Q.5. Define
(i) Magneto motive force(mmf) (ii) Reluctance (5*4=20)
(iii) Flux (iv) Relative Permeability
- Q.6. (a) Differentiate between primary and secondary cell. (10)
(b) Explain Faraday's laws of Electromagnetic Induction (10)
- Q.7. Explain the construction details and working of Nickel Cadmium Battery. (20)
- Q.8. Explain the effect of AC applied to a pure capacitance. (20)
- Q.9. Draw a block diagram of Hydro-electric Power Station. Label its various parts and write briefly function of each part. (20)
- Q.10. (a) Write down the advantages and disadvantages of Thermal Power Station. (10)
(b) Write short notes on:
(i) impedance triangle (ii) phase angle (10)

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MJ-22

Branch: E&C/IT/Computer/Med.Eltx.

Time: 3hrs

Scheme: New

Attempt any five questions.

Roll No. 16-07 - R 21 - 2703

Subject: Basic Electronics

Maximum Marks: 100

Semester: 2nd

- (Q.1) a: Write down the differences between Active and Passive Components. (10)
b: Draw Energy Level diagram of Insulators, conductors and semiconductors. (10)
- (Q.2) Define Co-valent bond. Draw and explain Atomic Structure of Germanium and Silicon (20)
- (Q.3) Draw and explain the circuit diagram of Center tapped full wave rectifier with necessary waveforms. (20)
- (Q.4) Explain full wave bridge rectifier with necessary waveforms and circuit diagram. (20)
- (Q.5) Draw and explain the structure of an NPN transistor. Also explain the mechanism of current flow in it. (20)
- (Q.6) Draw and explain Input and output characteristics of transistor in Common Emitter configuration. (20)
- (Q.7) Draw and explain single stage amplifier circuit in common emitter configuration also explain phase reversal of the output voltage. (20)
- (Q.8) Explain operation of a MOSFET(depletion or enhancement) with necessary diagrams. (20)
- (Q.9) Compare JFET, MOSFET and BJT. What are advantages and applications of CMOS? (20)
- (Q.10) a) Explain fixed bias configuration with the help of a circuit diagram. (10)
b) Explain H-parameters briefly. (10)

JAMMU & KASHMIR BOARD OF TECHNICAL EDUCATION

U-22
Subject: Communication Skills-II
Scheme: New

Semester: 2nd
M. Marks: 100

Roll No. 1607-22 M.2- 1687
Branch: All
Time: 03 Hours

Instructions:

1. Attempt all Questions.
2. Figures to the right indicate marks.

1. Answer the following question briefly:

- A. Describe the grandmother's routine in the village.
- B. Describe how the grandmother celebrated the writers return from abroad.
- C. Why were all the girls so fond of Isabel at school.
- D. Why were the Burmells not satisfied with the school their children went to.
- E. Why did the old farmer feed his grand-child and not himself with the copper coin.

2. Answer the following question briefly: [4x2½=10]

What are the delights of walking tours? Or

Describe the life of Henry Dunant after his disappearance from the public view? [10]

3. Give the summary of Poem, "All the world's A stage"? Or

Give the summary of poem "Pipa's Song"? [10]

4. Precise the following paragraph to its one third and also give a suitable title:

But to read nothing but books of fiction is like eating nothing but cakes and sweetmeats. As we need plain, wholesome food for the body, so, we must have serious reading for the mind. And here we can choose according to our taste. There are many noble books on history, biography, philosophy, religion, travel and science which we ought to read and which will give us not only pleasure but an education. And, we can develop a taste for serious reading, so that in the end it will give us more solid pleasure than even novels and books of fiction. [10]

5. Write a letter to your friend describing your first day in the college.

Or

Write a letter to toy company to send its price list and catalogue. [10]

Write a report in the form of a memo on the Cricket tournament held in your institution? Or

Draft a circular on informing the employees about change in office thing? [10]

- Q7.** Translate the following words into Urdu or Hindi:
A. Acid B. Alum C. Ampere D. Balance
F. Bridge G. Chain H. Flask I. Viscosity E. Base
J. Concrete [10]

Q8. What do you mean by written communication? What are its advantages?
Or

Q9. Explain horizontal and diagonal communication?
What do you mean by listening? Explain barriers to listening?
Or

What do you mean by downward communication? What are its advantages?
[10]

Q10. A. Change the voice (any five):

1. He threw the ball.
2. Tom painted the wall.
3. Inayat likes coffee.
4. The doctor is examining the patient.
5. She write a letter.
6. The teacher drew figures.
7. She is solving the sum.

[05]

B. Change the narration indirect speech (any five):

1. The child said, "Papa is busy now".
2. He said to me, "Have you seen the Taj Mahal".
3. I said to my friend, "Barking dogs seldom bite".
4. She said, "Why are you late".
5. He said, "Earth moves round the sun".
6. He says, "I am leaving".
7. Rita said, "I am going to Delhi".

[05]