

JAMMU & KASHMIR BOARD OF TECHNICAL EDUCATION

MJ-22

Subject: Power Electronics

Branch: E&C / Med Eltx

M. Marks: 100

Roll No. 1604-22.m4.17067

Semester: 4th

Scheme: New

Time: 03 Hours

Instructions:

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

- Q1. (a) What is a thyristor? Discuss its operation and characteristics? 10
(b) Describe the operational characteristics of UJT? 10
- Q2. Write short notes on: 2X10
(i) Online UPS (ii) HVDC transmission
- Q3. (a) Describe the operation of step-up chopper? 10
(b) Describe briefly the different methods of SCR triggering? 10
- Q4. Describe the working of a single phase full wave centre tapped rectifier feeding : 20
(i) purely resistance load (ii) R-L load
- Q5. (a) What do you mean by heat sink? Discuss in brief various types of heat sinks? 10
(b) Explain the working of fully controlled full wave bridge rectifier? 10
- Q6. (a) Draw and explain class C chopper circuit? 10
(b) Briefly explain the operation and working of a Cycloconverter? 10
- Q7. Describe the construction and working of UJT with the help of diagram. Explain its V-I characteristics? 20
- Q8. (a) Explain how will you control the speed of Dc motor using chopper drive? 10
(b) Write short note on Gate Turn Off Thyristor (GTO)? 10
- Q9. (a) What is a Cycloconverter? Enumerate some of its industrial applications? 10
(b) With the help of a diagram discuss the operation of a series inverter? Derive an equation for this circuit? 10
- Q10. Write short notes on: 2X10
(i) dual converter (ii) UJT as a relaxation oscillator.

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MJ-22

Subject: Microprocessors

Branch: E&C/Med Eltx

M. Marks: 100

Roll No. 17067

Semester: 4th

Scheme: New

Time: 03 Hours

Instructions:

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

- Q1. Explain evolution of microprocessors and list its applications? 20
- Q2. (a) Define Bus. Explain with diagram the Bus Organisation of 8085? 10
- (b) With the help of diagram explain the demultiplexing of Address/Data bus of 8085? 10
- Q3. Write an ALP for multiplication of two 8-bit numbers? 20
- Q4. (a) Explain the function of following pins/signals : 2x5
- (i) READY (ii) HOLD (iii) IO/M
- (iv) HLDA (v) ALE
- (b) With suitable examples define the terms Opcode and Operand? 10
- Q5. Explain with diagram DMA data transfer scheme and its types. List its applications? 20
- Q6. List and explain the operation of Data transfer group of instructions? 20
- Q7. (a) Write short notes on: 2x5
- (i) Machine Cycle (ii) Instruction Cycle
- (b) Explain Memory Mapped I/O scheme? 10
- Q8. Define addressing mode. Explain with examples the various addressing modes of 8085? 20
- Q9. Draw and explain the block diagram of 8255 Programmable Peripheral Interface chip? 20
- Q10. Draw and explain the Architecture of 8085? 20

MJ-22

Subject: Electrical Machines

Branch: E&C/ Med Eltx

M. Marks: 100

Instructions:

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

- Q1.(a) Discuss the advantages of 3 phase system over a single phase system? 10
 (b) Derive a relation between phase and line, voltage and current in a 3 phase system? 10
- Q2. Explain the working principle and constructional details of a D.C. motor 20
 .Derive an expression for the torque developed in a D.C motor? 10
- Q3.(a) Distinguish between motor and generator? 10
 (b) Explain torque equation and concept of torque angle. 10
- Q4.(a) A 3 phase transformer has 400 turns on the primary and 40 turns on the secondary. The supply voltage is 330V. Find the secondary voltage on no load when the winding are connected as: 10
 (i) star- delta (ii) delta -star
- (b) Explain with diagram the different types of excitations employed for d.c.generator? 10
- Q5. Explain the constructional details and working of a 3 phase transformer? 20
- Q6.(a) Explain the principle of working of polyphase induction transformer? 10
 (b) A 6 pole ,50Hz,3 phase induction motor runs at 960 r.p.m, when the torque on the shaft is 200 Nm.If the starter losses are 1500W and friction and winding losses are 500W,find: 10
 (i) rotar copper loss (ii) efficiency of the motor
- Q7. Write short notes on: 2x10
 (i) Universal motor (ii) A.C Servo motor
- Q8.(a) Draw and explain the working of star-delta starter for starting a 3 phase induction motor? 10
- (b) Discuss characteristics of D.C. series motor? 10
- Q9.(a) Explain the construction of a capacitor start and capacitor run motor? 10
 (b) Explain the principle of operation of a repulsion induction motor 10
 .Mention the types of load this motor is suitable for?
- Q10.(a) Explain Fraday's laws of electromagnetic induction? 10
 (b) Distinguish between Squirrel cage and Slip-ring induction motor? 10

MJ-22
Subject: Communication Systems-I
Branch: E&C
M. Marks: 100

Roll No. 17067
Semester: 4th
Scheme: New
Time: 03 Hours

Instructions:

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

- ✓ Q1. Draw the block diagram of AM Transmitter and explain the working of its each stage? 20
- ✓ Q2. With the help of block diagram explain the principle and working of Suoerheterodyne AM receiver. Draw the typical wave forms at the I/P and O/P of each block.S? 20
- Q3.(a) Describe the performance characteristics of a radio receiver? 10
(b) Draw and explain the Delayed AGC circuit? 10
- Q4.(a) What is Geo-stationary satellite? What is its need? 10
(b) Write a note on space wave propagation? 10
- Q5.(a) Describe the block diagram of FM receiver? 10
(b) Write short notes on splicing and lensing? 10
- Q6.(a) Draw the block diagram of satellite communication link and explain? 10
(b) Draw and explain the electromagnetic spectrum and explain its various ranges? 10
- ✓ Q7.(a) Write short notes on: 5+5=10
(i) polarization of electromagnetic waves
(ii) beam width
(b) Explain broad-side and end fire arrays? 10
- Q8.(a) Explain the principle of operation of Parabolic Dish. Why is parabola shape is used? What is its application? 10
(b) Describe the characteristics and applications of Yagi Antenna. 10
- Q9. Draw the block diagram of Optical communication link. Explain the function of its each block. What are the limitations of fibre optics system. 20
- Q10(a) Discuss in detail sky wave propagation? 10
(b) Write short notes on: 5+5=10
(i) Multiple hop propagation (ii) Virtual height

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MJ-22

Subject: Network Filters & Transmission Lines (NFTL)

Branch: E&C

M. Marks: 100

Roll No. 1604-22M4-17067

Semester: 4th

Scheme: New

Time: 03 Hours

Instructions:

1. Attempt any Five Questions.

2. Figures to the right indicate marks.

- Q1. (a) Differentiate between synchronous and asynchronous networks? 10
(b) Describe the following: 10
(i) balanced network (ii) lattice network
- Q2. Define the term propagation constant and derive its equation for 10
(a) synchronous $-T$ and synchronous- π network? ✓
(b) Explain the following terms: 10
(i) image impedance (ii) insertion loss ✓
- Q3. (a) Design a m -derived High Frequency Filter with a cut off frequency of 100KHz having design impedance of 5Ω and $m=0.4$? 10
(b) Define Z and Y parameters of a typical two port network? 10
- Q4. (a) Define and explain Decibel and Neper. Derive relation between the two? 10
(b) What is an attenuator? Derive the design equation for a T-type attenuator? 10
- Q5. Explain m -derived Low Pass Filter (LPF) and draw the required diagram. 20
What are the advantages of m -derived filter?
- Q6. (a) Explain T-representation of transmission line. Derive the expression for its characteristic impedance? 10
(b) Draw and explain the types of transmission lines? 10
- Q7. Explain the term LPF, HPF, BPF, BSF. Draw the pass band and attenuation band of each? 20
- Q8. The values of primary constants of a open wire line per loop Km are: 4x5
 $R=15\Omega$, $L=4mH$, $C=0.008\mu F$ and $G=0.5\mu mho$, for a single frequency of 1KHz, determine :
(i) characteristic impedance Z_0 (ii) propagation constant γ
(iii) attenuation α (iv) wavelength λ
- Q9. Derive expression of voltage and current for different transmission line terminations (open circuit, short circuit and termination by Z_0) in terms of sending end parameters? 20
- Q10. (a) What are the primary and secondary constants of a transmission line? 10
(b) Describe the concept of reflection and standing waves. derive a relation between VSWR and K ? 10

100

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