PUNE UNIVERSITY
[4363]-17-A
T. E. Printing, Examination - 2013
Surface Preparation I
(2003 Course)

[Total No. of Questions: 06]   [Total No. of Printed Pages: 2]
 [Time: 3 Hours]   [Max. Marks: 100]
Instructions:
  (1) All questions are compulsory.
  (2) Assume suitable data, if necessary.
  (3) Answers to the **two sections** *should be written in* **separate answer-books**.
  (4) Neat diagrams must be drawn wherever necessary.
  (5) Black figures to the right indicate full marks.
  (6) Use of   logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.

SECTION-I

Q. 1. A) Explain the following points to be considered while planning the job   (8)
   i) Size of the machine   ii) Size of the plate
   iii) Size of the book   iv) Quantity to be printed
   B) Explain the method of preparing the layout for any job to be printed   (8)
   with suitable diagrams.

<div align="center">OR</div>

   A) Draw the eight page imposition scheme with sheet work method and   (8)
   Label the elements.
   B) Draw the eight page imposition scheme with half sheet work method   (8)
      and label the elements.

Q. 2. A) List down the steps of preparing Water Deep plate in proper sequence. (8)
   B) Differentiate between Positive and Negative Pre Sensitized Plate.   (8)

<div align="center">OR</div>

   A) List down the steps of preparing Gum Deep etch plate in proper   (8)
   Sequence.
   B) Explain why Positive PS plates are called as Subtractive and Negative (8)
   PS plates as Additive plates?

Q. 3. A) Explain the Driographic printing process with suitable diagram.   (9)
   B) Explain the method of preparing the Toray plate.   (9)

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OR

A) Explain the method of preparing the Rubber plates used in Flexography. (9)

B) Explain water soluble photopolymer resin plate making. (9)

SECTION-II

Q. 4. A) Explain the Polyester master computer to plate technology in detail. (8)

B) Explain the use of Ctp in News paper industry. (8)

OR

A) What are the selection criterias of laser while designing the laser Plate making system. (8)

B) Suggest suitable Ctp technology for the commercial printing firm With proper justification. (8)

Q. 5. A) Explain various terminologies associated with the screen mesh. (8)

B) Differentiate between Direct and Indirect method of preparing the Screen. (8)

OR

A) Explain any one method of preparing the screen detail diagrams. (8)

B) Explain in detail the application of each making method. (8)

Q. 6. A) Explain various elements of the colour control bar. (9)

B) Find out the number plates required to print the following job: (9)
magazine

        Text pages: B/W : 96

        Cover page: Four colour : 04

        Size of the magazine : A4

        Size of the machine : 20" x 30"

        Quantity to be printed: 3000

OR

A) Explain various environmental considerations to be observed in the Plate making department. (9)

B) Find out the number of plates required to print the following job : (9)
Magazine

        Text pages : Two colour : 64

        Cover page : Four colour : 04

        Size of the magazine : A4

        Size of the machine : 18" x 23"

        Quantity to be printed : 1000

Total No. of Questions : 12   [Total No. of Printed Pages :5]

[Time : 3 Hours]   [Max. Marks : 100]
Instructions :

> *(1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, questions from each section I and Q.7 or Q.8, Q.9. or Q.10, Q.11 or Q. 12 question from section 2.*
> *(2) Answers to the **two sections** should be written in **separate answer-books**.*
> *(3) Neat diagrams must be drawn wherever necessary.*
> *(4) Assume suitable data, if necessary.*

SECTION-I

Q. 1. A) Show that the self information is always positive. Also calculate   (9)

H(X), H(Y), H(X,Y), H(X/Y), H(Y/X and I(X;Y) for a channel with

Three inputs X_1, X_2 and X_3, Three outputs Y_1, Y_2 and Y_3 with noise matrix as

given asP[Y/X]=[0.9,0.1,0:0,0.8,0.2:0,0.3,0.7] calculate where

$P(X_1)=0.3, P(X_2) =1/4, P(X_3)=0.9/2$.

B) What is mutual information? A voice single in a PCM system is   (9)

Quantized in 16 levels with following probabilities P1-P4=0.1,P5-P8=

0.05,P9-P12=0.075,P13-P16=0.025, calculate Entropy, Joint entropy

And information rate if fm=3KHz.

<center>OR</center>

Q. 2. A) Determine the Lampel ziv code for the following bit stream.   (9)

01001111001010000010101011001100110000.Recover the original

Sequence from the encoded stream.

B) State Shannon's first theorem? And obtain efficiency of a Shannon   (9)

Fano code for a zero memory source that emits six messages(A,E,H,N,

G,S) with probabilities of {0.19,0.15,0.02,0.16,0.4,0.08} respectively.

Given that A coded as '0'.

Q. 3. A) Obtain the code words for the (6,3) LBC which has the generator   (8)

Matrix of G-[110100:011010:101001], If code word C=101110 is

Transmitted and received code word is r=001110 obtain the correct code

word By use of syndrome polynomial.

B) Explain with the help of block diagram JPEG and DTC algorithms.   (8)

<center>OR</center>

Q. 4. A) Explain any two properties of mutual information and show that   (8)

Shannon's limit for AWGN Channel is -1.6db

B) Generate the CRC code for the data word of 110010101 with the   (8)

divisor having generator polynomial of $X^4 + X^2 + 1$.

Q. 5. A) For the Convolution encoder show in figure (1). Sketch the state   (8)

Diagrams and Trellis diagram. Find the output data sequence 10011.

<center>2</center>
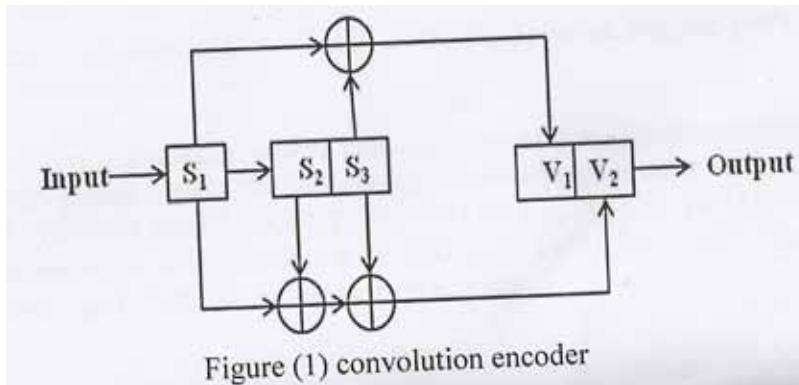
Figure (1) convolution encoder

Figure (1) convolution encoder

B) Write note on FEC and ARQ systems used in coding.   (8)

OR

Q. 6. A) Explain importance of coding gain and Unger becks portioning   (8)

Rule for the 8PSK TCM encoding.

B) The (1/2,3) convolution encoder has generating vectors as g1=(100),   (8)

g^2 =(110) and sketch the encoder and Trellis diagram. And decoded the

following sequences using Viterbi algorithm 11100000101.

SECTION-II

Q. 7. A) Design a (7,3) RS double error correcting code, find the systematic   (9)

Code for the Message $\alpha\ \alpha^3\alpha^5$.

B) What is cryptography technique? Explain AES Encryption and   (9)

Decryption detail.

OR

Q. 8. A) Design a BCH code with n=15 and error correcting capability   (9)

t=1.2.3,

B) Use the prime numbers 3 and 11 to find public key, private key. Also (9) Encrypt plain text m=4 and decrypt it.

Q. 9. A) Discuss the Bays estimation method briefly for Least Square (8) Estimation and kalman filter.

B) What are the criteria for the good Estimator, calculate the unbiased (8) Estimation of DC level With 'A' as unknown in presence of WGN.

OR

Q. 10. A) What is Cramer Rao bound inequality and what are its limitations (8) Discuss in detail.

B) Find maximum likelihood estimator of power of WGN with variance (8) σ^2 unknown with hypothesis H0 and H1with K no. of samples producing zero and m output respectively.

Q. 11. A) Derive the likelihood ratio test (LRT), under the Neyman Pearson (8) (NP) criterion for a binary hypothesis problem.

B) A ternary communication system Transmits one of three amplitude (8) Signals {1,2,3} with equal probabilities, The independent received signal Samples under each hypothesis are H1: Yk=1+N K=1,2,…K, H2:Yk=2+ N K=1,2,…K, H1:Yk=3+N K=1,2,…K , The additive noise N is Gaussian With zero mean and variance σ2, The costs are Cii=0, and Cij-1, determine The decision regions.

OR

Q. 12. A) In a binary communication system received signal is s (t)+n(t) is (8)

Gaussian noise with zero mean. The PDF of two hypotheses are

$$f(Y/H_0) = \frac{1}{\sqrt{2\pi}} e^{-y/2^2} \quad \text{and} \quad f(Y/H1) = \frac{1}{\sqrt{2\pi}} e^{-(y-1)^2/2^2}$$

calculate likelihood Ratio

B) Explain the concept of MINIMAX detector in detail. (8)

T. E. (Printing) Examination - 2013
PRINTING PROCESS INSTRUMENTATION
(2003 Course)

[Time : 3 Hours]   [Max. Marks : 100]
Total No. of Questions : 12   [Total No. of Printed Pages :3]

Instructions :
   *(1) Answer **any three** questions from each section.*
   *(2) Answers three questions from **Sections I** and three questions from **Section II***
   *(3) Answers to the **two sections** should be written in **separate answer-books**.*
   (4) Neat diagrams must be drawn wherever necessary.
   (5) Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.
   (6) Assume suitable data, if necessary.

SECTION I

Q1) a) Define the term servomechanism. Explain it with suitable example.   08

   b) Draw and explain block diagram of automatic control system with

      suitable example.   10

OR

Q2) a) List and explain different types of errors with suitable example.

      Explain how to overcome these errors.   10

   b) Compax electronic, pneumatic and hydraulic control system.   08

Q3) a) Define the term transducer with suitable examples give

      classification of transducers.   08

   b) Define the term humidity. Explain any one method to measure   08

   humidity.

OR

Q4) a) Explain electromagnetic flowmeter in detail.   08

b) Explain in detail construction of LVDT. List the applications   08

  of LVDT

Q5) a) Explain in detail construction and working of optocoupler.   08

b) Draw and explain sample and hold circuit   08

OR

Q6) a) Explain role of filters in printing applications.   08

b) Derive the equation for overall gain of instrumentation

  amplifier.   08

SECTION II

Q7) a) Write a note of different discontinuous controllers.   10

b) Explain proportional controller in detail.   08

OR

Q8) a) Define the terms:-   10

  i) Process Lag

  ii) Process Load

  iii) Process Equation

  iv) Control Lag

  v) Degree of Freedom   `

b) Draw and explain block diagram of final control operation.   08

Q9) a) Explain electronic PI controller in detail.   08

b) Explain pneumatic PID controller   08

OR

Q10) a) Integral controller is called x set controller, Justify Also explain how integral controller will eliminate offset?   08

b) Explain microprocessor based temperature control system.   08

Q11) a) Write a short note on SCADA   08

b) Explain multichannel data logger system in detail.   08

OR

Q12) a) Define the term PLC. Draw and explain architecture of PLC.   08

b) Draw and explain the block diagram and ladder diagram for

washing machine control system.   08

UNIVERSITY OF PUNE
[4363]-17
T. E. (*Printing*) Examination - 2013
PRINTING TELECTRONICS & OPTOELECTRONICS
(2003 Course)

[Time: *3* Hours]   **[Max. Marks: 100]**

SECTION -I

Q.1	A	What is amplitude modulation? Explain Pulse Amplitude Modulation in details.	8
	B	Explain role of optoelectronics in Printing Technology.	8

OR

Q.2	A	Draw and explain block diagram of communication system.	8
	B	What do you mean by modulation? Explain necessity of modulation.	8

Q. 3	A	Explain data encryption and decryption.	10
	B	Explain Pulse width modulation with suitable diagram (waveforms).	8

OR

Q. 4	A	Write short notes on 1.Time division multiplexing(TDM) 2.Frequency division multiplexing(FDM)	10
	B	State and explain "Sampling theorem" with an example.	8

Q. 5	A	What is quantization? Explain uniform & non uniform quantization.	8
	B	Write short notes on 1.Videotext 2.Teletext	8

OR

Q. 6	A	What are different channel interferences? Explain noise interface.	8
	B	Explain companding using suitable diagram.	8

SECTION II

Q. 7	A	Explain any four types of optocouplers with the help of	8

suitable diagrams.

	B	Explain working principle of LASER with suitable diagram.	8

OR

Q. 8	A	Explain working of LASER printer.	8
	B	What are different photo detectors? Explain working of any one photo detector.	8

Q. 9	A	Draw and explain block diagram of basic fiber optic communication system.	10
	B	Draw and explain different types of fiber optic cables.	8

OR

Q. 10	A	Describe different losses in fiber optic cable with suitable diagrams.	10
	B	Distinguish between step index and graded index fiber.	8

Q. 11	A	Explain smart ticket application using RFID.	8
	B	Explain Wi-Fi technology.	8

OR

Q. 12	A	Explain any one application of RFID in field of printing in detail.	8
	B	Explain plate making application using Laser.	8

UNIVERSITY OF PUNE
[4363]-18
T. E. (Printing) Examination - 2013
THEORY OF PRINTING MACHINES & MACHINE DESIGN
(2003 Course)

[Time: *4* **Hours]**   **[Max. Marks: 100]**

Instructions:

1. *Answer 3 questions from Section I and 3 questions from Section II*
2. *Answers to the two sections should be written in separate answer-books.*
3. *Neat diagrams must be drawn wherever necessary.*
4. *Black figures to the right indicate full marks.*
5. *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
6. *Assume suitable data, if necessary.*

SECTION -I

Q.1   **A**   State and prove the law of gearing.   6

      B   Two gear wheels of diameters 75 mm and 250 m have involute teeth   10
of 5 mm module and 20°angle of obliquity. The addenda are equal
and as large as possible while avoiding interference. Find:
- i)   The addendum
- ii)   The contact Ratio
- iii)   The sliding velocity at the start of contact, if the pinion is driving at 2000 rev/min.

OR

Q.2   **A**   What do you mean by undercutting in involute gears?   4

      B   Derive an expression for the length of path of contact in a pair of   12
meshed spur gear.

Q. 3   **A**   What do you understand by ear train? Discuss the various gear   10
trains.

      B   Explain the terms train value and velocity ratio used in gear trains.   6

OR

Q. 4   **A**   In the epicyclic gear train shown in Fig. the compoundwheels 'A'   16
and 'B' as Internal wheels 'C' and 'D' rotates independently about
the axis 'O'. The wheels 'E' and 'F' rotates on the pins fixed to arm
'a'. All the wheels are of the same module. The number of teeth on
the wheels are $T_A=52$, $T_B=56$, $T_E=T_F=36$.
Determine the speed of 'C' if:
- i)   The wheel 'D' fixed and arm 'a' rotates at 200 rpm

clockwise.
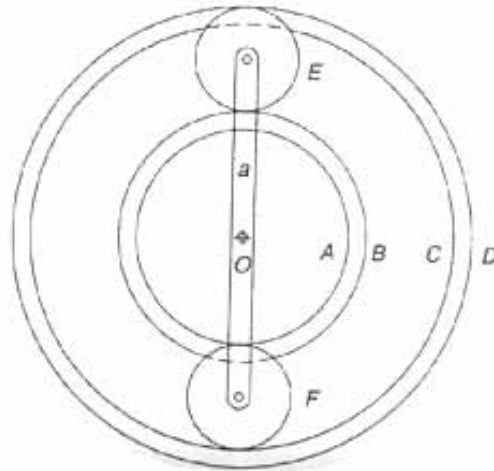The wheel 'D' rotates at 200 rpm counterclockwise and the arm 'a' rotates at 200 rpm clockwise.

Fig. for Q.4

Q. 5   A   Draw the profile of a cam operating a knife edge follower and with the following data: 18
Minimum radius of cam=25 mm,
Lift = 30 mm.
The cam lifts the follower for 90° with uniform velocity followed by dwell period of 30°. Then the follower lowers down during 120° of the cam rotation with uniform acceleration and deceleration followed by a dwell period. If the cam rotates at a uniform speed of 150 rpm, calculate the maximum velocity and acceleration of the follower during the descent period.

OR

Q. 6   A   Give the classification of different type of follower with their application.   6

       B   Draw and Explain the Displacement, velocity and acceleration diagrams for uniform velocity motion and cycloidal motions of follower.   12

SECTION II

Q. 7   A   Compare the Soderberg, Goodman and Gerber Approach for fatigue analysis.   8

       B   What is Stress Concentration? What are is causes and explain the methods of reducing stress concentration.   8

OR

Q. 8   A   A transmission shaft of cold drawn steel 27 Mn2 (Sut= 500 N/mm^2 and Syt=300 N/mm^2) is subjected to a fluctuating torque which   8

varies from - 100 N-mm to + 400 N-mm. The factor of safety is 2 and the expected reliability is 90%. Neglecting the effect of stress concentration, determine the diameter of the shaft.

Take K_a=0.8, K_b=0.85, K_c=0.897
Assume the distortion energy theory of failure.

B Differentiate between the various forms of dynamic loading. 8

Q. 9   A   A spur pinion having 20 teeth is to mesh with a gear having 43 teeth. 18
The pinion and gear are to be made of plain carbon steels having ultimate tensile strengths of 600 N/mm^2 and 400 N/mm^2 respectively. The pinion is to be driven by three phase induction motor having a speed of 1440 r.p.m and 12 k W rating. The starting torque of the motor is twice the working torque. If the surface hardness of the gear pair is o be 400 BHN, design a gear pair with a factor of safety of 1.5.
Assume velocity factor accounts for the dynamic load.
Assume 20° full depth involute tooth system.
$Y=0.484-(2.87/Z)$ and b=10m
First choice of std. modules in mm recommended by ISO:
1, 1.25, 1.5, 2, 2.5, 3, 4, 5, 6, 8, 10, 12, 16, 20, 25, 32, 40.

$K=0.16[BHN/100]^2$ K_a=2 and K_m=1

OR

Q. 10 A   Draw the FBD of a spur gear pair and derive the relationship for the 8
various forces acting on them.

B   Explain causes and remedies for the following gear tooth failures, 10
  i)   Bending failure
  ii)   Destructive pitting failure
  iii)   Abrasive wear.

Q. 11 A   A deep-groove ball bearing having bore diameter of 60 mm and 12
rotating at 1440 rpm is subjected to a radial force of 2500 N and axial forces of 1200 N. The radial and thrust factors are 0.56 and 2.0 respectively. The load factor is 1.2. If the expected rating life is 25000 hours, calculate the required basic dynamic capacity of the bearing.

B   Compare ball and roller contact bearings. 4

OR

Q. 12 A   Explain the procedure of selection of bearing from manufacturer's 8
catalogue.

B   Explain bearing life with the help of graph of percentage bearings in 8
operation Vs the bearing life.

UNIVERSITY OF PUNE
[4363]-187
T. E. (*E & TC*) Examination - 2013
SYSTEM PROGRAMMING AND OPERATING SYSTEM
(2008 Course)

[Time: *3* Hours]   [Max. Marks: 100]

Instructions:

1 *Answers to the* **two sections** *should be written in* **separate answer-books**.

2 *Neat diagrams must be drawn wherever necessary.*

3 *Assume suitable data, if necessary.*

SECTION -I

Q.1	A	What do you understand by Grammar? Explain the use of Terminal and Non-Terminal in representing grammar.	4
	B	Explain Allocation data Structures used in language processing.	4
	C	How Pass I of an assembler works. Explain the algorithm in detail with data structures used.	8

OR

Q.2	A	What are language processor development tools? Explain the working of Lex and YACC.	8
	B	Define following terms and explain where it is used with examples. (i)DFA (ii)Regular Expression (iii)Forward Reference (iv)Back Tracking	8
Q. 3	A	Explain the process of Macro Expansion with relevant data structures.	8
	B	Explain the use of Register Descriptor and Operand descriptor.	6
	C	What are the differences between Compiler and Interpreter?	4

OR

Q. 4	A	List down various code optimization techniques. Explain any two techniques in detail with example.	8
	B	Explain the process of alteration of flow of control during macro expansion.	4
	C	List down the steps in designing a Macro Preprocessor.	6

| Q. 5 | A | Why program relocation is required and how is it performed? | 6 |
| | B | Explain the five different types of editor with their applications? | 10 |

OR

Q. 6	A	In case of a Direct Linking Loader, what is the information required to be passed by a translator to the loader.	4
	B	Explain the need of a linker in program development.	4
	C	List down the components of a programming environment. Explain any two components in detail.	8

SECTION II

| Q. 7 | A | Explain functions of an Operating System. | 8 |
| | B | Write short notes on the following. (i)Process Control Block (ii)Critical Section (iii)Round Robin Scheduling | 10 |

OR

Q. 8	A	What are deadlock? How deadlocks avoided in operating system. Explain it with suitable example.	8
	B	Draw and explain process state transitions.	6
	C	Explain preemptive and non preemptive concept with example.	4
Q. 9	A	Give similarities and differences between paged and segmented memory management schemes.	8
	B	How virtual memory system is utilized in memory management? Explain in details.	8

OR

| Q. 10 | A | Mention different page replacement algorithms and explain any one of them. | 8 |
| | B | How operating system utilizes swapping technique in memory management? Explain in details . | 8 |

| Q. 11 | A | Explain different I/O software layers. | 8 |
| | B | Draw and briefly explain the file structure. | 8 |

OR

| Q. 12 | | Write short note on . 1.File management 2.Disc space management 3.Interface management 4.Power management | 16 |