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Total Number of Pages: 02

B.Tech.
PME51101

5th Semester Regular Examination 2017-18
Machining Science and Technology

BRANCH: MECH

Time: 03 Hours

Max Marks: 100

Q.CODE : B498

Answer Question No.1 and 2 which are compulsory and any four from the rest.
The figures in the right hand margin indicate marks.

Q1 Answer the following questions: *multiple type or dash fill up type* (2 x 10)

- a) When cast iron is cut _____ chip produced.
- b) In a single point turning operation of steel with cemented carbide tool, Taylor's tool life exponent is 0.25. If the cutting speed is halved, the tool life will increase by
a) Two times b) Four times c) Eight times d) Sixteen times
- c) Size of shaper is given by
a) Stroke length b) Motor power c) Weight of the machine d) Table size
- d) In horizontal milling process _____ (up/down) milling provides better surface finish and _____ (up/down) milling provides longer tool life.
- e) The rake angle in a drill
Increases from center to periphery
Decreases from center to periphery
Remains constant
Is irrelevant to the drilling operation
- f) Abrasive material used in grinding wheel selected for grinding ferrous alloys is
a) Silicon carbide b) Diamond c) Aluminium oxide d) Boron carbide
- g) The main purpose of boring operation, as compared to drilling is to:
a) Drill a hole b) Finish the drilled hole
c) Correct the hole d) Enlarge the existing hole
- h) Which one of the following materials used as the bonding material for grinding wheels?
a) Silicon carbide b) Sodium silicate c) Boron carbide d) Aluminium oxide
- i) For machining a complex contour on tungsten carbide work piece, which process will be used?
a) ECM b) EDM c) USM d) EBM
- j) In ECM the material removal is due to
a) Corrosion B) Erosion C) Fusion D) Ion displacement

Q2 Answer the following questions: *Short answer type* (2 x 10)

- a) What is meant by orthogonal cutting and oblique cutting?
- b) What is the use of chip breaker?
- c) What are the situations where diamonds are used as cutting tools?
- d) Why grey cast iron does not need any lubrication during machining?
- e) What is the difference between a 'face plate' and 'drive plate'?
- f) What is meant by 'grades' and 'structures' of grinding wheels?
- g) Describe the dressing and balancing requirements in grinding.
- h) Differentiate between up milling and down milling.
- i) What type of work is most suitable for LBM?

- j) What are the functions served by the dielectric fluid in EDM? (8)
- Q3** a) Sketch a single point cutting tool under ORS system. Define various tool angles and discuss their importance. (8)
- b) Following data is recorded relating to orthogonal cutting: (7)
- Feed force=850 N; cutting force=1600 N', chip thickness ratio=0.26; tool rake angle= 10°
 calculate a) compression and shear force and
 b) coefficient of friction between chip and tool face
- Q4** a) What are the main function of cutting fluid? Discuss types of cutting fluid and various methods of applying it at cutting zone. (8)
- b) What is machining time? Find the time required for one complete cut on a piece of work 350 mm long and 50 mm in diameter. cutting speed is 35 m/min and feed is 0.5 mm/rev. (7)
- Q5** a) Describe the method of operation of the swiss type automatic lathe, with applications and tools used. What is its speciality? (10)
- b) What are the different lathe accessories? What are the advantages of using a collect chuck? (5)
- Q6** a) Sketch and describe a vertical milling machine. (8)
- b) Calculate the indexing needed for 97 divisions with available hole circle: (7)
- 15,16,17,18,19 and 20 holes and change gear set:
 24,28,32,40,44,48,56,64,72,86 and 100.
- Q7** a) What is the classification method that could be used for grinding machines? Give the applications of each variety of grinding machines. (10)
- b) What are the advantage and disadvantages of centerless grinding? (5)
- Q8** a) Explain in detail, with neat diagram the working of electro discharge machining process. Write its advantages, disadvantages and application. (10)
- b) What is the principle of USM? What are the different types of transducer used in USM? (5)
- Q9** Answer any THREE : (5X3)
- a) Tool wear
 b) Surface grinding machine
 c) Cutting oil
 d) LBM