Register Number.....

B.E. DEGREE EXAMINATIONS: APRIL / MAY 2009

Third Semester

MECHANICAL ENGINEERING

U07ME304 Machine Tool Engineering

Time: Three Hours **Maximum Marks: 100**

Answer ALL the Questions:-

PART A (20 x 1 = 20 Marks)

1. Match List 1 and List 2 and select the correct answer using the codes given below:

List I	List II
a. Continuous chips	1. Transient and not stable
b. Discontinuous chips	2. High cutting speed
c. Continuous chips with built-up edge	3. Brittle materials
d. Long and continuous chips	4. Ductile materials

A. a3, b4, c2, d1 B. a2, b3, c4, d1 C. a4, b3, c1, d2 D. a4, b1, c2, d3

2. The force of tool acting downward against the motion of chip, as it moves along the tool face is called as

A. Friction B. Normal force C. Resultant force D. Frictional resistance

3. The relationship between cutting speed and tool life is given by Taylor's formula as

A. $V / T^n = C$ B. $VT^n = C$ C. $V^n / T = C$ D. $VT = C^n$

4. The quantitative measure of machinabilty, which is used to compare the different metals is termed as

A. Machinability index B. Machinability rating
C. Machinability factor D. Machinability number

5. In Lathe operations, the finishing and sizing of a hole is done by

A. Reaming B. Boring C. Grinding D. Filing

6. In Capstan and Turret Lathes, the following mechanism is used:

A. Quick return mechanism B. Bar feeding mechanism
C. Reciprocating mechanism D. Rotary mechanism

7. In the following type of shaper, the job can be tilted in any direction through the required angle with the help of swivel vice:

A. Universal shaper B. Mechanical shaper
C. Vertical shaper D. Hydraulic shaper

8. Which of the following statement(s) is/are not correct?
(i) The planer is used for producing large and heavy work pieces
(ii) The planer is used for producing small identical pieces
(iii) Setting of work piece on the planer table requires skill
(iv) Work is stationery and tool reciprocates

A. (i) & (iv) B. (ii) & (iv) C. (iii) only D. (iv) only

9. The angle between the face and line parallel to the drill axis is known as

A. Point angle B. Rack angle C. Edge angle D. Clearance angle

10. The following type of operation is only carried out by broaching, due to the exceptional difficulties in machining of surfaces by other methods:

A. Splines B. Keyways C. Hole D. Slots

11. The degree of hardness of grinding wheel is specified by

A. Numbers B. Codes C. Alphabets D. Symbols

12. The process of making higher, lustrous, reflective finish to be made on the surfaces of work piece, which cannot be obtained by polishing process, is known as

A. Honing B. Lapping C. Dressing D. Buffing

13. The milling cutter advances of distance in one complete revolution is termed as

A. Lead B. Gash C. Land D. Fillet

14. The milling surface is parallel to cutter axis in

A. Face milling B. Peripheral milling
C. Angular milling D. Gear cutting

15. The axes are mutually perpendicular to each other in the

A. Spur gears B. Helical gears C. Bevel gears D. Worm gears

16. In bevel gear generation process, the axis of the blank is inclined at _____ angle with the horizontal.

A. $90^{\circ} + {}^{1}/_{2}$ Pitch cone angle B. $90^{\circ} - {}^{1}/_{2}$ Pitch cone angle
C. $90^{\circ} / {}^{1}/_{2}$ Pitch cone angle D. $90^{\circ} \times {}^{1}/_{2}$ Pitch cone angle

17. The following non-traditional machining process is classified based on the mechanism of ion displacement:

A. Ion Beam Machining (IBM) B. Ultra Sonic Machining (USM)
C. Electro Chemical Machining (ECM) D. Laser Beam Machining (LBM)

18. (i) The non traditional machining processes are influenced by the work piece shape and size

(ii) Metal Removal Rate (MRR) can not influence the process capability of the non traditional machining processes

A. (i) and (ii) are true
B. (i) only true
C. (ii) only true
D. (i) and (ii) are false

19. The dielectric fluid used in Electrical Discharge Machining (EDM) should

A. not have a good degree of fluidity
B. slowly quenches the spark
C. provide an effective cooling medium
D. have low dielectric strength

20. Wire cut Electrical Discharge Machining (EDM) process is used for making

A. Press stamping dies
B. Printed circuit boards
C. Glass engraving
D. Micro drilling

PART B (5 x 16 = 80 Marks)

21.(a) (i) Explain the mechanism of metal cutting with a neat line diagram. (8)

(ii) Describe the properties and classification of cutting tool materials. (8)

(OR)

(b) (i) Draw the Merchant's circle diagram and work out the relationship between various forces and angles during metal cutting process. (8)

(ii) Discuss about the tool geometry and tool designation (8)

22.(a) (i) Explain the constructional features of a Lathe with a neat sketch. (8)

(ii) What are the various types of planers? Explain any one in detail with a net diagram. (8)

(OR)

(b) (i) Discuss about the work holding and supporting devices used in a Lathe. (8)

(ii) List out the various parts of a shaper and explain with a neat sketch. (8)

23.(a) (i) Explain the radial drilling machine with a neat sketch. (8)

(ii) How will you specify a broaching machine? What are its advantages and limitations? (8)

(OR)

(b) (i) Explain the various drilling operations in detail. (8)

(ii) List out the types of grinding machines and explain the cylindrical grinding machines in detail. (8)

24.(a) (i) Explain about the horizontal milling machine with a neat sketch. (8)

(ii) Explain the gear generating process in detail. (8)

(OR)

(b) (i) Describe the any four types of milling cutters in detail. (8)

(ii) Narrate the gear finishing methods and explain any one method in detail. (8)

25. (a) (i) Explain about the Ultra Sonic Machining (USM) process with its applications and limitations. (8)

(ii) Explain the working principle of Laser Beam Machining (LBM). (8)

(OR)

(b) (i) Describe the salient features of Abrasive Jet Machining (AJM) with a neat diagram. (8)

(ii) Explain the Electro Chemical Machining Process (ECM) in detail. (8)

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