

**INDIAN MARITIME UNIVERSITY**  
(A Central University, Govt. of India)

May/June 2015 End Semester Examinations

**SEMESTER – II, M.B.A (INTERNATIONAL TRANSPORTATION AND LOGISTICS /  
PORT AND SHIPPING MANAGEMENT)**

**QUANTITATIVE TECHNIQUES FOR BUSINESS (T 1201)**

**Date: 04.06.2015**

**Time: -3 Hrs**

**Max.Marks:60**

**Pass Marks:30**

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**SECTION – A**

**(12x1=12 Marks)**

*Answer ALL the questions. All question carry equal Marks*

1. When A and B are two mutually exclusive and exhaustive events, then
  - a)  $P(A) + P(B) = 0$
  - b)  $P(A) + P(B) = 1$
  - c)  $P(A) + P(B) < 1$
  - d)  $P(A) + P(B) > 1$
  
2. A card is drawn at random from a well shuffled pack of cards. What is the probability that it is a heart or a queen ?
  - a)  $1/52$
  - b)  $1/26$
  - c)  $2/13$
  - d)  $4/13$
  
3. A random sample is drawn to represent
  - a) the population under study
  - b) the population of the country
  - c) Primary data
  - d) Secondary data
  
4. The relation between A.M, G.M and H.M
  - a)  $A.M \geq G.M \leq H.M$
  - b)  $A.M \geq G.M \geq H.M$
  - c)  $A.M \leq G.M \leq H.M$
  - d) None of the above
  
5. The goodness of fit is tested by the
  - a) F distribution
  - b) t distribution
  - c)  $\chi^2$  distribution
  - d) Z distribution

6. In testing of hypothesis, Type I error is
- rejection of null hypothesis  $H_0$  when it is true
  - accepting null hypothesis  $H_0$  when it is true
  - accepting null hypothesis  $H_0$  when it is false
  - none of the above
7. If six unbiased coins are thrown simultaneously , the average number of heads is given by
- 12
  - 6
  - 3
  - 2
8. Mean, median and mode are common measures of
- dispersion of data
  - skewness of data
  - central tendency of data
  - none of the above
9. If the height of MBA students (  $X$  ) is normally distributed with population mean 163cm and population standard deviation 3.5 cm, the standard normal  $Z = (X - 163)/3.5$  is having:
- Normal distribution with population mean 0 and population standard deviation 1
  - Chi- square (  $\chi^2$  ) distribution
  - Students t distribution
  - None of the above
10. The harmonic mean (H.M) of 1,  $1/2$ ,  $1/4$  and  $1/5$  is given by :
- $39/80$
  - $1/12$
  - 3
  - $1/3$
11. The normal distribution and the t distributions are :
- Both asymmetric
  - Both symmetric
  - Normal distribution symmetric but t- distribution asymmetric
  - None of the above
12. If the event A = “it will be raining today” and the event B = “ classes will be held” are independent , then  $P(A \text{ and } B) =$
- $P(A).P(B)$
  - $P(A)/P(B)$
  - $P(B)/P(A)$
  - None of the above

**SECTION – B****(5x4=20Marks)**

***Answer ANY five of the following questions. Each answer should not exceed 200 words.***

13. Compute the angles of the Pie chart to represent the following information pertaining to the various components of costs of a shipping vessel in a particular operation . [ An indicative pie chart ,if drawn, would be appreciated ]

Cost of materials : Rs38.40 lakhs ; Cost of labour : Rs.30.72 lakhs ; Direct expenses of service : Rs 11.52 lakhs; Overhead expenses : Rs 15.36 lakhs

14. Discuss primary and secondary data sources with examples for collection of data in a study.
15. A bag contains 3 white and 4 black balls. One ball is drawn from the bag and then replaced. Again another ball is drawn . Find the probability that the both balls drawn are white.
16. The daily wage that a worker on contract in a logistic company gets is normally distributed with mean Rs.200 and standard deviation Rs 5. Find the probability that a worker will get daily wage more than a) Rs 200, b) between Rs 190 and Rs200. [ The area under the standard normal curve between 0 and 2 =0.4772)
17. The total cost function  $TC = 31 + 24Q - 5.5Q^2 + Q^3/3$  , where Q denotes quantity produced. Find out the values of Q at which TC attains maxima or minima.
18. Find out  $\int 12X^2 (X^3 + 2) dX$
19. State briefly applications of statistics in business and economy.

**SECTION – C****(4x7=28 Marks)**

***Question No. 20 is compulsory. Answer ANY THREE of the remaining questions  
Each answer should not exceed 500 words.***

20. The Sumudra Manthan Logistics Company is operating three modern ship-to-shore container cranes A , B and C in the Port of Haldi at Tamluk . The management has collected 5 sample observations on crane productivity for each of the three cranes. They are presented in the following table.

Crane Productivity		
Crane A	Crane B	Crane C
20	18	25
21	20	28
23	17	22
16	15	28
20	25	32

Use ANOVA to test if the mean productivity of the three cranes are same or different. [  $F_{2,12,0.05} = 3.89$  ]

21. The average life time of a sample of 100 bulbs is 1570 hours with a standard deviation of 120 hours. The company claims that the average life time of the bulbs produced is 1600 hours. Is the claim acceptable at 5% level of significance ? (Given  $Z_{0.025} = 1.96$  )

22. The following 2X2 contingency table shows the gender related employment data for an upcoming urban growth centre.

	Employed	Not employed
Male	1480	5720
Female	120	680

Test if employment is independent of gender . [  $\chi^2$  with 1 d.f = 3.84 ]

23. The degree of whiteness readings obtained for three detergents under varying conditions of water temperatures are given below.

Water Temperature	Detergent A	Detergent B	Detergent C
Cold water	57	55	67
Warm water	49	52	68
Hot water	54	46	58

Perform a two way analysis of variance using 5% level of significance.(Given  $F_{2, 8, 0.05} = 6.94$  )

24. Discuss the applications of Operation Research in business.

25. Solve by graphical method.

Maximise  $Z = 3X_1 + 5X_2$ , Subject to

$$X_1 \leq 4$$

$$2X_2 \leq 12,$$

$$3X_1 + 2X_2 \leq 18,$$

$$X_1, X_2 \geq 0$$

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