

Scientific Asst. (Instrument)

Written Test for the post of ~~Scientific Asst. (Instrument)~~ (MFCP)

1. What is the percentage confidence level for a coverage factor  $k=2$  ?  
a) 99              b) 96              c) 95
2. Name parameter, associated with the result of a measurement, that characterizes the dispersion of the values that could reasonably be attributed to the measurand?  
a) traceability              b) uncertainty              c) accuracy
3. In a volume calibration area; which of the following has not any immediate effect on calibration results ?  
a) humidity              b) temperature              c) sound
4. Which part of ISO 8655 deals Gravimetric methods for the determination of measurement error?  
a) part 2              b) part 5              c) part 6
5. Clean rooms can be classified according to which ISO standard ?  
a) ISO 14644              b) ISO 16446              c) ) ISO 14664
6. what is the standard uncertainty of a reported expanded uncertainty of  $0.26^{\circ}\text{C}$ ?  
a)  $0.15^{\circ}\text{C}$               b)  $0.36^{\circ}\text{C}$               c)  $0.13^{\circ}\text{C}$
7. Sample standard deviation is calculated as?  
a)  $\sqrt{(\sum(x_i - x_{\text{mean}})^2/n)}$     b)  $\sqrt{(\sum(x_i - x_{\text{mean}})^2/n-1)}$     c)  $\sum(x_i - x_{\text{mean}})^2/n$
8. Find the variance for 10, 8, 10, and 6?  
a)  $4/3$               b)  $\sqrt{(4/3)}$               c)  $3/4$
9. National Apex body of metrology in India  
a) NABL              b) NPL              c) COFRAC
10. Traceability can be established using?  
a) Calibration              b) CRM              c) both

11. Which is not a fixed point cell in ITS-90?  
a) gallium cells                      b) TPWcells      c) none
12. Saturated salt baths are used in-----Calibrations?  
a) Temperature              b) mass                      c) Humidity
13. For the calibration of E2 Class mass set ; reference should be of -----Class.  
a) E3                      b) E2                      c) E 1
14. Which of the following is not used for rpm calibrations?  
a) spectroscope                      b) stroboscope                      c) ) tachometer
15. Statistical estimates are used in which type of uncertainty?  
a) Type A                      b) Type B                      c) Type C
16. BI used in steam sterilization ?  
a) *bacillus atraupheus*                      b) *bacillus stearothermophilus*                      c) both
17. Challenge packs are used in ?  
a) *EO sterilization*      b) Efficacy testing      c) Radiation sterilization
18. -----is used as a RM for wavelength calibration of spectrophotometer?  
a) *Potassium dichromate*      b) Toluene      c) Holmium Oxide
19. which is the correction factor in gravimetric method of volume measurements?  
a) *En*                      b) Z                      c) Q
20. In a temperature distribution measurement of an oven; the maximum recorded temperature is 37.5 ° C and minimum is 36.5° C at geometrical centre for the stabilised logging time.Find the control stability parameter?  
a) 1° C                      b) 0.5° C                      c)2° C
21. unit of sound level measurement  
a) *dB*                      b) Hz                      c)A
22. Which is not a external quality control method?  
a) PT                      b)ILC                      c)CV analysis
23. For a thermometer calibration the essential requirements includes  
1.Temperature bath  
2.Reference thermometer  
3.Trippl point cell  
a) 1&2                      b)1&3                      c)2&3

24. In regression analysis x intercept corresponds to ----- in the equation of straight line ?  
 a) y                      b)m                      c) c
25. Minimum TAR ratio for the selection of Reference equipments in calibration?  
 a) 1:2                      b)1:10                      c)1:20
26. *Potassium dichromate* is the RM used in?  
 a) pH calibration                      b)RH calibration                      c)spectrophotometer calibration
27. Selection of Reference equipment for calibration shall be based on its  
 a) Accuracy    b) calibration uncertainty                      c) both
28. ATCC stands for  
 a) Accreditation test's Cell culture    b)American type cell culture  
 c)Active type cell culture
29. Equipment used for light measurement  
 a) manometer                      b) barometer                      c) lux meter
30. Capability of a Calibration lab is indicated by  
 a) CMS                      b)CMC                      c)RMC
31. Uc stands for  
 a) combinational uncertainty                      b)combined standard uncertainty    c)none
32. Ishikawa diagram is otherwise called  
 a) cause analysis diagram    b) cause &effect diagram    c) cost effective diagram
33. Plotting control chart is a means for  
 a) External quality assurance                      b)Internal QA                      c) 3rd party assessment
34. J type T/C has  
 a) Aluminium vs Constantan                      b) ICopper vs Constantan    c) Iron Vs Constantan
35. S I unit of temperature is  
 a)° F                      b)°C    c) K
36. Microbiological sterility is a must in the use of ----- in cytotoxicity evaluations  
 a) Negative control RM                      b)positive control RM c) both
37. Which of the following cannot give a traceability in measurement  
 a)NPL, UK                      b)NPL, India                      c) NABL
38. Verification masses are used in the quality checks of  
 a)Mass                      b)balances    c) pipettes

39. When a test/calibration is repeated by different persons at different time spans is called  
 a) repeatability                      b) reproducibility              c) readability
40. Before using an equipment for accredited tests; following checks are important  
 a) Accuracy                      b) Calibration status              c) both
41. For RH calibrations salt solutions are kept as  
 a) saturated                      b) unsaturated                      c) solidified
42. Accelerated aging studies are done in RM preparation to study  
 a) storage RH                      b) storage temperature              c) shelf life
43. Quality system requirement for testing and calibrations laboratories are given in  
 a) ISO 13485                      b) ISO 17025              c) ISO 9000
44. IQ, OQ and PQ is a must in----- qualification of EO sterilization system  
 a) Routine                      b) Initial                      c) functionality
45. What is the value of k for a confidence level of 95%?  
 a) 1.95                      b) 1.96                      c) 2
46. Find the expanded uncertainty with 95% confidence level of a thermometer calibration  
 ; if its combined standard uncertainty is given as  $0.012^{\circ}\text{C}$   
 a)  $0.02^{\circ}\text{C}$                       b)  $0.024^{\circ}\text{C}$                       c)  $0.06^{\circ}\text{C}$
47. Find the expanded uncertainty of speed calibration at 10 000 rpm. Given that accuracy of stroboscope is 3.46 rpm ,its calibration uncertainty is 2rpm ,and standard deviation for 9 repeated rpm measurement is 0.6 rpm .Note that  $\sqrt{3}$  is 1.73 and  $k=2$ .  
 a) 4.49 rpm                      b) 2.29                      c) 1.59
48. Emergent stem correction is applicable in the calibration of  
 a) digital thermometer                      b) glass thermometer                      c) both
49. The indicators imprinted in tyvek bags which change color on sterilization are belong to  
 a) Biological indicator                      b) chemical indicator                      c) both
50. Accreditation status of Calibration certificates can be identified with  
 a) accreditation Number                      b) NABL symbol                      c) either

**Answer Key- MFCP for Scientific Assistant (Instruments) - Calibration Cell**

1. C
2. B
3. C
4. C
5. A
6. C
7. B
8. A
9. B
10. C
11. B
12. C
13. C
14. A
15. A
16. B
17. B
18. C
19. B
20. B
21. A
22. C
23. A
24. B
25. A

- 26. C
- 27. C
- 28. B
- 29. C
- 30. B
- 31. B
- 32. B
- 33. B
- 34. C
- 35. C K
- 36. C
- 37. C
- 38. B
- 39. B
- 40. C
- 41. A
- 42. C
- 43. B
- 44. B
- 45. C
- 46. B
- 47. A
- 48. B
- 49. B
- 50. C