

**UNIVERSITY COLLEGE TATI (UCTATI)****FINAL EXAMINATION QUESTION BOOKLET**

COURSE CODE	: MPU 3332
COURSE	: RUBBER INDUSTRY IN MALAYSIA
SEMESTER/SESSION	: 1 2022/2023
DURATION	: 1.5 HOURS

Instructions:

1. This booklet contains questions. Answer **60** questions.
2. All answers should be written in **OMR sheet**. Only use **2b** pencil.
3. Write legibly and draw sketches wherever required.
4. If in doubt, raise up your hands and ask the invigilator.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE TOLD TO DO SO

THIS BOOKLET CONTAINS 14 PRINTED PAGES INCLUDING COVER PAGE

RUBBER INDUSTRY IN MALAYSIA (MPU 3332)

1. Sir Henry Wickham, at the request of the India Office, collected and shipped from Brazil 70,000 seeds from the wild rubber tree. These were rushed to Kew Gardens in London and planted in specially prepared hot-houses. The small number, which survived, was taken in _____ to Ceylon and later to Malaysia and other countries of South-east Asia.
 - A. 1890's
 - B. 1870's
 - C. 1990's
 - D. 1970's

2. Rubber compounding means _____.
 - A. Treatment to retard its deterioration due to oxidation
 - B. Depression of its freezing point
 - C. Selecting and combining elastomers and additives
 - D. Improving its curing rate

3. Which of the following is the most important rubber compounding ingredient which is used to retard the deterioration of rubber compounds initiated by oxygen, heat, ozone and light.
 - A. Additive
 - B. Antidegradant
 - C. Softener
 - D. Activator

4. Pick out the **WRONG** statement about procedure for compound development.
 - A. Estimate cost of compound selected for further evaluation
 - B. Use compound to make a product sample
 - C. Test product sample against performance specification
 - D. Scrap and reject of these materials can be recycled-environmental friendly behavior

5. Polyisoprene is a _____.
- A. Synthetic rubber
 - B. Natural rubber
 - C. Filler
 - D. Softener
6. Which of the following is a copolymer.
- A. SBR
 - B. BR
 - C. PVC
 - D. Polystyrene
7. _____ is the process by which the latex is collected from a rubber tree.
- A. Rubber tapping
 - B. Rubber waxing
 - C. Rubber mixing
 - D. Rubber calendaring
8. Which of the following is **NOT** the criterion of plasticizer selection.
- A. Compatibility
 - B. Efficiency
 - C. Cost
 - D. Selectivity
9. Uncured rubbers have high viscosity so mechanical working of the rubber can increase its temperature up to _____°C.
- A. 80
 - B. 100
 - C. 150
 - D. 300

10. Fillers such as zinc oxide and carbon black are added to the crude natural rubber before vulcanisation in order to improve its _____.
- A. Plasticity
 - B. Viscosity
 - C. Weathering characteristics
 - D. Scorch
11. Premature vulcanization means _____.
- A. To secure certain properties in the finished product to satisfy service requirements
 - B. not thoroughly mixed with the base rubber
 - C. To attain processing characteristics necessary for efficient utilization of available equipment
 - D. To achieve the desirable properties and processability at lowest possible cost
12. Scientific name for rubber tree is _____.
- A. *Hevea brasiliensis*
 - B. *Hevea guianensis*
 - C. *Hevea benthamiana*
 - D. *Hevea microphylla*
13. Synthetic rubbers are supplied to rubber processors in the form of _____.
- A. Pellet
 - B. Resin
 - C. Powder
 - D. Bale
14. Which of the following component is **NOT** involve in tyre manufacturing process.
- A. Tread
 - B. Plies
 - C. Bead coil
 - D. Chain

15. To avoid premature vulcanization, _____ process is usually employed.
- A. Two roll mill
 - B. Banbury-type internal mixer
 - C. Two stage mixing
 - D. Carcass
16. The main use of filament reinforcement is _____.
- A. In the manufacture of synthetic rubber
 - B. As a plasticiser for unsaturated polyester
 - C. As an anti-skimming agent in paint
 - D. To reduce extensibility but retain the other desirable properties
17. Reinforced tube consist 3 layers which is _____.
- A. Sidewall, reinforcement layer, plies
 - B. Tread, bead, drum
 - C. Outer layer, reinforcement layer, inner tube
 - D. Curing, vulcanized, mixing
18. _____ is a process which rubber stock is passed through a series of gaps of decreasing size by a stand of rotating rolls.
- A. Extrusion
 - B. Calendering
 - C. Coating
 - D. Molding and casting
19. Which of the following is **NOT** about rubber processing into finished goods.
- A. Rubbing
 - B. Mixing
 - C. Shaping
 - D. Compounding

20. Out of all the elastomers, natural rubber has the longest elongation range & flexibility of the order of _____ percent.
- A. 2000-2500
 - B. 1500-2000
 - C. 1-1000
 - D. 1000-1500
21. _____ makes the rubber stiffer and stronger but retain extensibility.
- A. Vulcanization
 - B. Extrusion
 - C. Antioxidants
 - D. Lubricants
22. Ziegler process _____.
- A. employs very high pressure
 - B. produces low density polythene
 - C. uses catalyst
 - D. Was developed in 1998
23. Pick out the **WRONG** statement.
- A. Molded parts for footwear are produced by injection molding, compression molding
 - B. Plain hose (no reinforcement) is extruded tubing
 - C. Without crosslink, an elastomer may be elongated beyond elastic limit
 - D. Normal crosslinked polymers can be recycled
24. Function of pneumatic tires on vehicle is _____.
- A. Transmit the motor torque to propel the vehicle
 - B. Reduce the weight of the vehicle, passengers, and cargo
 - C. Expel water of the vehicle when raining
 - D. Consists of multiple layers of rubber-coated cords for vibration

25. Sulfur, metallic oxides and organic peroxide are items for _____.
- A. Vulcanizing Agents
 - B. Accelerators
 - C. Activators and Retarders
 - D. Antidegradants
26. Carbon black is important as reinforcing filler because _____.
- A. Carbon black also provides protection from ultraviolet radiation
 - B. To secure certain properties in the finished product to satisfy service requirements
 - C. To attain processing characteristics necessary for efficient utilization of available equipment
 - D. To achieve the desirable properties and processability at lowest possible cost
27. Which of the following is **NOT** the basic category of shaping processes.
- A. Extrusion
 - B. Calendering
 - C. Swelling
 - D. Molding and casting
28. SBR is produced by the polymerisation of _____.
- A. Butadiene monomer + polystyrene
 - B. Polybutadiene + styrene monomer
 - C. Acrylonitrile + styrene
 - D. Acrylonitrile + butadiene
29. Crosslink density means _____.
- A. Total number of crosslink in the system
 - B. Increase the time of process and quantity of crosslink
 - C. Increase its viscosity to permit easier processing in crosslink
 - D. None of these

30. Internal structure of tyre known as _____.
- A. Plies
 - B. Steel
 - C. Nylon
 - D. Carcass
31. Which country is the largest producer of rubber in Southeast Asia?
- A. Malaysia
 - B. Indonesia
 - C. Thailand
 - D. Vietnam
32. Cis means that two pendent group (H and CH₃) that are _____.
- A. Located on the opposite side of the carbon carbon double bond
 - B. Located on the same side of the carbon carbon double bond
 - C. Called gutta percha
 - D. Used for golf balls
33. Rubber belts are normally made of rubber due to its flexibility, but the belt must have little or no extensibility. Therefore, it is reinforced with _____.
- A. PVC
 - B. Polyamides
 - C. Cellulose
 - D. Polyester
34. Which of the following represents natural rubber chemically?
- A. Cis 1,4-polyisoprene
 - B. Trans 1,4-polyisoprene
 - C. Cis 1,3-polyisoprene
 - D. Trans 1,3-polyisoprene

35. After the seeds were germinated in Europe, there was a plan to begin commercial cultivation of rubber trees in Southeast Asia. Where were the seedlings first sent?
- A. Australia
 - B. Indonesia
 - C. Sri Lanka (Ceylon)
 - D. Thailand
36. Concurrently with the development of the rubber industry, great strides were made in the technology of working with rubber, which drove up the demand for latex. One of Vandelay Industries' important customers is an American tire company named for the inventor of the process of vulcanization. Who was this inventor?
- A. Richard Bridgestone
 - B. Charles Goodyear
 - C. Harvey Firestone
 - D. Harvey Firestein
37. What are the sequential processes through which rubber latex undergo to give natural rubber?
- A. Tapping-preservation-coagulation
 - B. Preservation-tapping-coagulation
 - C. Tapping-coagulation-preservation
 - D. Coagulation-tapping-preservation
38. Which tree gives out the latex to obtain natural rubber?
- A. Eucalyptus
 - B. Hevea brasiliensis
 - C. Anogeissus
 - D. Astragalus
39. Where did rubber originate?
- A. The Americas
 - B. Africas
 - C. South East Asia
 - D. India

40. The natural rubber industry is quite healthy, because developments in the manufacture of a transportation-related item required the use of natural rubber. What item is it?
- A. Boot soles
 - B. Tires
 - C. Balloons
 - D. Rubber bands
41. Which of the following is **NOT** the future challenge of rubber industry in Malaysia.
- I. Oil price fluctuation
 - II. USA General Election
 - III. Monsoon
 - IV. Birth rate
- A. I, II
 - B. II, III
 - C. I, IV
 - D. II, IV
42. The objectives of Malaysian Rubber Board are _____.
- I. To be a leading organisation in all areas of the rubber industry for the benefit of society
 - II. To promote and develop the Malaysian rubber industry
 - III. To further boost smallholders' productivity amid increasingly limited agricultural land
 - IV. To develop national objectives, policies and priorities for the orderly development and administration of the Malaysian rubber industry
- A. I, III, IV
 - B. I, II, III
 - C. I, II, IV
 - D. I, IV

43. In 2017 budget, our Prime Minister has announced incentives to help rubber industry in Malaysia. Which of the following statement is **TRUE**.

- I. The Government will implement the floor price system
- II. Subsidise the price of cooking gas as well as charges for toll and public transport
- III. Monthly allowance of RM200 for the months of November, December and January
- IV. Foster research culture as well as to increase productions

- A. I, IV
- B. I, III
- C. I, II
- D. II, III

44. Established on 1 January 1998, Malaysian Rubber Board (MRB) has under its fold three well established agencies. Which of the following are those three agencies.

- I. RRIM (Rubber Research Institute of Malaysia)
- II. MRRDB (Malaysian Rubber Research and Development Board)
- III. MRELB (Malaysian Rubber Exchange and Licensing Board)
- IV. PRIM (Polymer Rubber Industry in Malaysia)

- A. I, III, IV
- B. III, IV
- C. I, II, III
- D. II, IV

45. Accelerators are added to rubber to _____.

- I. Reduce vulcanization time
- II. Increasing speed of vulcanization
- III. Xanthates is a type of accelerator
- IV. Transmit the motor torque to propel the vehicle

- A. I
- B. I, II
- C. I, II, III
- D. I, III, IV

46. Rubber belts are normally made of rubber due to its flexibility, but the belt must have little or no extensibility. Therefore, it is reinforced with _____.

- I. PVC
- II. Nylon
- III. Cellulose
- IV. Polyester

- A. I, IV
- B. II, IV
- C. II, III
- D. IV

47. Compared to other elastomeric materials, natural rubber shows _____.

- I. Higher tensile strength
- II. High tear strength
- III. High resilience
- IV. Resistance to wear

- A. I, II, III, IV
- B. I, III
- C. I, II, IV
- D. II, III, IV

48. Natural rubber is used more extensively because _____.

- I. Of its low cost
- II. Increase needs for elastomeric materials-
- III. Highly elastomeric
- IV. High temperature stability

- A. II, IV
- B. I
- C. III
- D. I, II, III, IV

49. Chemical formula for polyisoprene is _____.

- A. $(C_5H_8)_n$
- B. C_6H_6
- C. C_5H_8
- D. $(C_4H_7)_n$

Choose True or False for each following statement from Question 50 until Question 60:

50. Rubber price will decrease if crude oil prices increase.

- A. True
- B. False

51. A weaker ringgit makes a nation's exports more competitive, thus making rubber price increase.

- A. True
- B. False

52. Tighter natural rubber supply will make rubber price increase.

- A. True
- B. False

53. Malaysia is global consumer of natural rubber latex.

- A. True
- B. False

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54. Malaysia leads the highest motor vehicle production in ASEAN.
- A. True
 - B. False
55. Scientific name for rubber tree is *Hevea Brasiliensis*.
- A. True
 - B. False
56. Indonesia is the largest producer of rubber in the world.
- A. True
 - B. False
57. Rubber is a natural polymer.
- A. True
 - B. False
58. The latex used in making rubber is not the sap of a rubber tree.
- A. True
 - B. False
59. Rubber waxing is the process by which the latex is collected from a rubber tree.
- A. True
 - B. False
60. Rubber compounding mean depression of its freezing point.
- A. True
 - B. False

-----End of questions-----