



CONSTRUCTION  
INDUSTRY COUNCIL  
建造業議會

# **Plant and Equipment Operator (Tunneling) - Segment Erection Intermediate Trade Test Mock Written Test Paper**

此文件關於機械設備操作工（隧道）- 拱塊安裝工藝測試考題有需要索取此文件的中文版本，請致電 2100 9232 與工藝測試中心聯絡。

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1. On the vacuum erector, what does the sign S.W.L 10 ton mean ?
  - (a) load of moving object must not be greater than 10 ton
  - (b) if load is greater than 10 ton, machine can only be used when additional hydraulic jacks are installed
  - (c) working time of vacuum must be maintained within 10 mins
  - (d) hydraulic oil must be added every 10 mins
  
2. What is the common hand tools used for installing concrete segment ?
  - (a) chain block
  - (b) welding machine
  - (c) air gun
  - (d) coupler
  
3. Which one is the installation/connection method for concrete segment ?
  - (a) shear force
  - (b) spear bolts connection
  - (c) reinforcement bending
  - (d) reinforcement connection
  
4. What should you do when there is a power failure during vacuum erector operation ?
  - (a) secure segment on ground, turn on backup power immediately
  - (b) record time of power failure, to avoid punishment by supervisor
  - (c) no need to secure segment, inform electrician immediately
  - (d) arrange workers to erect temporary support below segment

5. Please choose the correct function of a vacuum erector
- (a) raising segment
  - (b) lifting & moving segment
  - (c) lifting locomotive
  - (d) to be used as temporary support
6. During segment installation, can TBM be operating at the same time ?
- (a) cannot, when operating together will increase wear on machine
  - (b) cannot, ring must be completed before continue excavation for annulus grouting
  - (c) can, because operation are not related to each other
  - (d) can, depends on skill of vacuum erector operator
7. During segment erection, hydraulic thrust ram must be extended to support segment, what is the main function of the thrust ram ?
- (a) to ensure enough space for segment erection
  - (b) to avoid personnel falling from height
  - (c) to increase the stability of vacuum erector
  - (d) to ensure segment erected is secure
8. Does operator has to follow the segment number during segment erection ?
- (a) Yes, to allow easy assessment of progress
  - (b) Yes, each segment has been numbered based on their relative position
  - (c) no, operator can decide themselves
  - (d) no, the segment number is for record purpose only

9. During lifting operation of segment, how should the segment be placed to avoid accident ?
- (a) increase the number of worker
  - (b) place lower than vacuum erector
  - (c) place segment on top of each other
  - (d) ensure the chosen placing location of segment will not cause overloading on machine
10. In which circumstances can vacuum erector be released safely ?
- (a) decide freely by operator
  - (b) operator to check to ensure segment connection is secured before releasing
  - (c) must complete grouting before releasing
  - (d) must inform safety officer before releasing
11. Before segment installation, operator should pay attention to which of the following ?
- (a) inspect segment to check for water leakage
  - (b) arrange enough manpower to install temporary support
  - (c) wrap segment in protective material to avoid damage
  - (d) check erection position of segment
12. How can operator safely install segment ?
- (a) use hydraulic thrust ram
  - (b) use strong adhesive
  - (c) use chain block
  - (d) pay attention to sound during installation

13. During segment lifting operation by vacuum erector, which of the following should pay attention to ?
- (a) must finish install segment within time limit
  - (b) the sudden explosion of segment during lifting
  - (c) the stability of vacuum erector during lifting
  - (d) to minimize noise from vacuum erector during lifting
14. Before lifting and installation of segment, what should be prepared in advance ?
- (a) prepare aerial platform
  - (b) prepare adequate number of spear bolts
  - (c) increase vacuum suction pressure
  - (d) turn on alarm
15. Is the weight and shape of segment within one ring exactly ?
- (a) yes, they are
  - (b) no, different weight but same shape
  - (c) no, same weight but different shape
  - (d) no, different due to the design
16. What is the purpose of annulus grouting after segment installation ?
- (a) no purpose, routine work
  - (b) filling connection joint of segment
  - (c) to increase the sticking strength of segment on the tunnel
  - (d) to fill the annulus gap between segment and excavated tunnel

17. During segment installation, how can operator ensure a good quality ?
- (a) prior inspection of segment to check for damages and crack
  - (b) operator should check the concrete by hitting segment with hammer
  - (c) replace segment if there is a slight difference in colour
  - (d) none of the above
18. Can two operators operate two vacuum erector separately at the same time during segment installation ?
- (a) can, to increase progress
  - (b) can, depends on the number of operator
  - (c) can, because vacuum erector are located on both side and can be used at the same time
  - (d) cannot, because large amount of space is required for the erector
19. If cracks have been discovered at the bolt pocket, what should you do ?
- (a) repair with grout yourself and continue
  - (b) drill extra bolt pocket for replacement
  - (c) stop and inform supervisor
  - (d) use other bolt pocket for lifting
20. What safety precaution should be in place to protect other worker during segment erection ?
- (a) inform everyone to stay away from the area
  - (b) insolate erection area and lock the operators cabin
  - (c) if needed to work in erection area, prior agreement with operator is required
  - (d) during installation, must provide a walking access between the left and right side

21. Which of the following should pay attention to when installing segment ?
- (a) must ensure body parts of worker is in safe position before moving segment
  - (b) must spray concrete segment with water constantly for curing
  - (c) must have the supervision from safety officer
  - (d) none of the above
22. During segment erection, operation should pay attention to :
- (a) if worker has enough strength to do the job
  - (b) if there are enough workers
  - (c) if proper PPE has been used
  - (d) the correct hand signal by workers
23. During segment erection, why should operator pay attention to hand signal of the other worker ?
- (a) for recording working time
  - (b) to speed up the progress
  - (c) to understand the number of segment for transportation
  - (d) to avoid accident
24. Operator must be appointed by the company, the reason is :
- (a) to ensure the quality of built ring
  - (b) to reduce installation time
  - (c) reduce wear on machine to prolong machine life
  - (d) ensure safe and competent operation



25. What should operator pay attention to during operation ?
- (a) water leakage on tunnel
  - (b) noise from machine parts
  - (c) if there are any workers inside operation area
  - (d) if nearby worker is smoking
26. After ring is built, how can operator ensure the safety of erector ?
- (a) remove vacuum erector from support beam
  - (b) remove key from control box
  - (c) remove battery from machine
  - (d) remove fuel completely to avoid fire
27. During segment installation, what warning sign should be in place near erection area ?
- (a) beware of slippery floor
  - (b) wear ear protection
  - (c) do not enter erection area
  - (d) power stoppage time & date
28. During crane lifting operation, what does the hand signal mean in the picture ?

- (a) raising the hook
- (b) lowering the hook
- (c) lower the hook slowly
- (d) raise the hook slowly



29. During crane lifting operation, what does the hand signal mean in the picture ?

- (a) take a rest
- (b) stop immediately
- (c) crane is ready to drive
- (d) raising the job



30. During crane lifting operation, what does the hand signal mean in the picture ?

- (a) take a rest
- (b) stop immediately
- (c) drive slowly in a closer distance
- (d) ready to start

